City of Bloomington
Common Council

Legislative Packet

Special Session

07 July 2010

Office of the Common Council
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City of Bloomington Indiana

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To: Council Members
From: Council Office
Re: Weekly Packet Memo
Date: July 2, 2010

Packet Related Material

Memo
Agenda
Calendar
Notices and Agendas:
None

Reports for Special Session

Report on Proposed Materials Recovery Facility (MRF)

- Monroe County Solid Waste Management District (District) Update – Prepared by Larry Barker, Director
- District Strategic Planning Report (April, 2010) - Prepared by Strategic Development Group, Inc.
- District Materials Recovery Facility Cost Assessment (June, 2010) - Prepared by Strategic Development Group, Inc.

Contact: Councilmember Volan at 333-0900 or volans@bloomington.in.gov

Legislation for Final Action:
None

Legislation and Background Material for First Reading:
None

Minutes from Regular Session:

- June 30, 2010

Memo

Reminder: Departmental Budget Hearings Will be Held on Monday, July 19th through Thursday, July 22nd – Starting at 6:00 p.m.

Special Session to Hear Report Regarding Materials Recovery Facility (MRF) Being Considered by the Monroe County Solid Waste Management District (District) on Wednesday, July 7th

Last Wednesday, the Council voted to cancel the Committee of the Whole scheduled for next Wednesday and hold a Special Session instead to hear a series of presentations regarding a Materials Recovery Facility (MRF) that is being considered by the Monroe County Solid Waste Management District (District).

Report on Possible MRF

Councilmember Volan is the Council representative on the District board (Board) and along with Councilmember Wisler has been interested in starting a MRF in the community for many years. The Board (with a contribution of $3,800 from the City) funded a studies by Strategic Development Group, Inc. regarding this matter. Those studies included a Strategic Planning Report (dated April, 2010) and a Materials Recovery Facility Cost Assessment (dated June, 2010). They are enclosed in this packet together with a District Update (which is in its 20th year).

Although the Board has not yet acted upon this information, Councilmember Volan wanted the Council to begin a serious discussion on the issue now because the City's possible role in the MRF *may* have implications on the City's 2011 Budget, which will be introduced for discussion later on this month. To that end, the persons responsible for these documents will make presentations to the Council and, along with Susie Johnson, Director of the City's Department of Public Works, be available to answer any questions you may have. Please note that the Council will not need take action on the information other than a Motion to Acknowledge Receipt of the Report.

Although it's too early to make any decisions on the matter, you may want to explore:

- Whether the installation and operation of a MRF makes sense for the community?
- If so, what role should the City have in its creation and operation?

The following are summaries of three documents included in the packet.

Item One - District Update

Larry Barker, Director, of the Monroe County Solid Waste Management District, provided an Update of the District, which in its 20th year of operation. In brief summary, the Update indicates that the District:

- Has expanded its hours of operation – 7:30 a.m. to 5:30 p.m. Tuesday through Saturday - to provide more access to the facility for the working public;
- Has expanded its collection to include plastics #1 - #7, which matches City practice, and markets glass to Indianapolis;
- Has entered into a contract with Electronics Recycling International to take electronics which will cost residents $1 per item for disposal;
- Has continued its spring and fall Bulk Item Days at the Fairgrounds which recently took in over 114 tons of waste dropped off by about 1,200 residents (the next event will be on October 8th & 9th);
- Is exploring recycling opportunities with bars and restaurants;
- Is continuing to offer educational outreach through presentations, "infomercials," and tours; and
- Is studying the feasibility of starting a Materials Recovery Facility (MRF) at the former Otis Elevator site.

Item Two - Strategic Planning Report (April 2010 Prepared by SDG

Executive Summary – In an effort to seek efficiencies in the managing of recycled materials at the District, the Strategic Report analyzed the cost, value and logistics of a MRF and also looked at other possible efficiencies.

It suggests that outreach programs to encourage higher participation by residents and collaboration with members of the IU community offer inexpensive opportunities to increase recycling.

The vicissitudes of the day-to-day recycling market and the scarcity of landfills require the District to plan long term, but take incremental steps towards its recycling goals.

List of Key Informants – The Report lists 17 persons with experience in recycling and solid waste who were consulted during its preparation.

Current Programs The District operates a Recycling Center (at a cost of $402,000 in 2009, 67% of which was for personnel) and four rural garbage and recycling stations (at a cost of $458,000, 22% of which was for personnel). Total value of assets is less than $165,000.

Income The District had an annual income of $1.145 million with approximately $823,000 coming from property and vehicle taxes, $288,000 coming from fees from trash bags and the Green Building Network, and about $34,000 coming from the sale of recyclables. The Report notes that a delay in receipts and a downturn in the market led to a lower than usual income from the sale of recyclables.

Expenses – Solid Waste and Recycling The cost for both the disposal of solid waste and recyclables involve a processing (or tipping) and a transportation charge. In 2009, the District disposed of 2,288 tons of garbage with a $41.86/ton tipping fee and a $21.29/ton transportation fee for a total cost of $63.15/ton or $145,000 for the year. That same year the District collected 2,930 tons of recyclables with an average processing fee $41.9/ton[1] and a transportation charge of $41.13/ton for a total cost of $83.03/ton or $243,000 for the year. The Report notes that the cost per ton for disposing of recyclables is higher than for disposing of solid waste because the charge for transportation is twice as high.

The Net Cost for Disposing of Recyclables is $10 Higher than Disposing of Solid Waste – Despite Opportunity to Sell Recyclables The Report notes that under current operations, it would be cheaper to put the recyclables in the landfill than recycle them (by $10/ton). Selling recyclables (in a better market) would allow the District to bring the cost of recycling down to cost of land-filling or $63/ton.

Recycling of Recyclables Not Assured Companies have incentives to landfill rather than recycle these commodities and might do so, unless the agreement with the District prohibits that action (which it does).

Chart of Recycling Streams in Monroe County There is a one-page chart presenting the recycling stream for the District, City and IU.

[1] At the time of the study, the District collected cardboard, mixed paper/magazines, newspaper, books, sorted office paper, scrap/steel, aluminum cans, glass and plastic #1 & #2. The processing fee ranged from $54/ton for the various forms of paper to $0 for the metal. As noted previously, some of this recyclable stream was sold and yielded income of approximately $34,000.

National Market – Crash in Late 2008 The Report cautions that the market is subject to "extreme fluctuation (in) prices." In particular, it graphs the crash in the prices of these commodities in late 2008, when most values dropped to 5% - 20% of their highs in the course of a few months and provides accounts of how some MRF's folded. With this in mind, it offers the following wisdom:

- recognize that the market "does tend around a center point;"
- don't expand based upon unrealistic market prices; and
- be willing to continue a program because of its non-economic (environmental) benefits.

Local Market The Report looks at the rate and net income from recycling at the District, the City, IU, Vincennes and Seymour. It concludes that Bloomington has the highest rate (tons/person) because it is has the most urban density and offers curbside service, yet serves less than half of its population. It also concludes that Vincennes and Seymour make more money from sales that the District because it:

- "has not been able to effectively negotiate or establish a competitive bidding process;" and
- "lacks processing capabilities for recyclables" which can compress and store these commodities and, thereby, make it more profitable for companies to take them.

Barriers to Bidding in the Solid Waste Transport Business Can be Overcome
The Report explains the lack of competition in the solid waste transportation business. "Many companies do not aggressively pursue new opportunities" because trash pick-up:

- is a necessity where there cannot be an interruption in service;
- does not have a large market because transportation costs limit the territory that can be effectively served; and
- involves contracts that take a large amount of time and money to negotiate (otherwise known as a high "transaction cost").

That said, it notes that three vendors are located within operating range - Hoosier, Rumpke, and Ray's Trash – and suggests District personnel can do more to cultivate their interest.

List of 23 Recycling Vendors Who Could Serve the Community

Pay-As-You-Throw (PAYT) Municipal Solid Waste Systems Both the District and City raise money for sanitation through a hybrid Pay-As-You-Throw (PAYT) system which charges for trash tags (City) or bags (District) that cover part of the cost of the programs. These are hybrid systems because other revenues - taxes - are also needed to cover the entire cost of the program. PAYT systems have three advantages. They are:

- Environmentally Sustainable – by increasing recycling and reducing amount going to the landfill;
- Economically Sustainable – by generating (or "integrating") revenue to cover recycling and composting programs (and, to do this, the fee must be periodically adjusted to cover the underlying costs); and
- Fair – by allowing those who throw away less pay less;

Pay-As-You-Throw (PAYT) – Rate Setting The Report discusses the setting of rates and favors doing so by drawing upon other community models rather than by working off an elaborate and inherently speculative formula. After recognizing that the minimum rate is driven more by the desire to reduce the land-filling of recyclables than the raising of revenues, the Report looks at the upper limit. Here it acknowledges that fees will not cover all costs, foresees savings via a MRF, and concludes that higher prices will result in less-than-projected revenue because households will reduce the disposal of waste and pack each bag with more waste (or what the Report refers to as the "Seattle Stomp" effect). In the interim, it says current rates should suffice for three to five more years.

Environmental Value of Recycling The Report describes six environmental benefits of recycling which include:

- Reducing the energy needed to manufacture goods and the emission of greenhouse gases (CO2) emitted through avoiding the full processing of virgin materials;
- Reducing disease and disability due to reduction in air pollutants;
- Reducing certain highly toxic compounds (i.e. toluene and2,4 –D) and acidification and eutriphication;
- Extending the use of existing landfills and hastening the bio-degredation that occurs there; and
- Redirecting plastics - which will never degrade in a landfill - to another round of use and, thereby, lowering the risk it will poison the environment.

Recycling Infrastructure Strategies – The Long Term The Report stresses the importance of maintaining a long term perspective that balances the inherent and sometimes extreme market fluctuations with future economic, environmental, and regulatory conditions In part that means: continue to invest in infrastructure during market lows and not expanding based upon market highs.

The best systems, it says, are "automated single stream systems." As you can imagine, these systems automate and mechanize the process from curbside pickup all the way down the line. Trucks with automated lifts empty standardized containers issued to every household and then haul the material to a MRF where it is sorted automatically by machine. Fiber optic devices help separate glass. The inevitably higher rates of contamination are more than offset by the higher volumes (due, in part, to the higher participation rate by the community). Overall, however, they are very expensive and only pay for themselves when there is a large, regional recycling stream.

Adding organics – food and yard waste - as a recycling stream would reduce greenhouse gases emitted from landfills and could be processed into fertilizer and then sold.

MRF Proposal and Recommendations The primary economic advantage to a MRF is that it attracts more vendors who are willing to pay more for these commodities. The MRF sorts, compacts and stores recyclables, which allows vendors to take a complete load of a commodity each time they visit the facility. That optimizes costs – particularly fuel. In particular, it allows one truck trip to do what 10 previously did – which will significantly reduce the carbon footprint as well. The MRF would also add three to seven new jobs.

Some Costs and Risks Associated with Balers and MRFs The Report notes that balers are expensive (either when purchased outright or leased) and can break down. A local MRF can lower the risk of a breakdown interfering with operations by working with an experienced company with a good reputation and by incorporating training and support in the contract.

The Report quickly dismisses a City concern Larry Barker relayed regarding our "relationship with Hoosier Disposal and Recycling if the District decides to own and operate a MRF." In short, it says there isn't much to be worried about because:

- the District Board has "direct input on the regulation of gate fees;"

- "Hoosier does not have a monopoly … and can be replaced;"
- The Contract between the two won't be adjusted for five years; and
- "Hoosier is unlikely to engage in action that could be perceived as retaliatory negotiating."

Key Design Principles for MRF (including Collaboration) The Report offers some direction if pursuing a MRF. In particular, MRF should:

- Continue operating during machine failure by building in redundancy;
- Be expandable and have leadership that looks for collaborations (e.g. with IU) to bring in additional volume;
- Provide space for at least two weeks storage of commodities;
- Plan for maintenance and support of equipment.

Recommendations The Report makes the following recommendations:

- Do not base infrastructure plans on the high or low price of recyclables because of the history of the rapid market fluctuations;
- Cultivate relationships with waste management industry by sharing information on the needs of both parties in order to revive competition in bidding for hauling contracts;
- Increase the capability for processing recyclables as funds allow;
- Anticipate expansion when building infrastructure;
- Collaborate with local entities – like the City and IU – in order to achieve the efficiencies associated with increased volume;
- Prioritize and maintain outreach efforts to keep the community informed about what can be recycled and how;
- Prohibit vendors, via the contract, from land-filling the recyclables;
- Separate glass from the other recycling streams in order to reduce contamination and injury (even at the expense of lower participation rates and lower over all volume);
- Incorporate construction of a MRF in the District's long term plans because of its financial and environmental benefits.

Direction of Further Study The Report points to gaps in recycling services in the City (e.g. apartments and businesses) which offer opportunities that deserve further study.

Appendix: Baler Facts, Etc.

Item Three - Materials Recovery Facility (MRF) Cost Assessment (June 2010) Prepared by SDG

This Report investigated the following in regard to a starting a MRF in this community:

- Cost for retrofitting OTIS
- Purchase and Installation of equipment
- Projected Revenues
- Projected Expenses

Executive Summary and Findings

Otis. Otis after a retrofit would have sufficient space as well as internal and external infrastructure to operate a MRF. Space should accommodate:

- unprocessed materials for up to a month and
- two or more balers with appropriate sorting lines and equipment.

Capital vs. Labor Costs. Sorting materials with equipment is more efficient than by hand and produces a "more refined and less contaminated product." However, the capital investment in equipment will take years to pay for itself. For example, the $180,000 it costs to purchase and install equipment that separates non-ferrous (aluminum) and heavy from light (glass from plastic) materials equals the cost of two additional sorting employees for three years at a total of $180,000.

Blast and Seal Floor. The floor must be sandblasted and sealed in order to contain spills that may be toxic.

Move and Protect Office Equipment. The office equipment would be moved from the Green Building Network (and not purchased) and must be covered to keep out the dust.

Cash Reserve. It's advisable to build and maintain a cash reserve. The reserve should match individual circumstances and market conditions. Martin County keeps $300,000 - $600,000 which is about half of the operating expense.

Projected Costs

Projected capital costs are $774,500 for:

- retrofitting the 66,000 sf Otis building for operation as a MRF;

- purchasing (not leasing) balers and sorters and maintaining them; and
- purchasing a roll-off truck or outsourcing those functions.

Projected annual operating expenses (with equipment purchased and not leased) is $330,000 and includes:

- staff to operate MRF
- a certified driver to operate the truck
- lease of property
- maintenance
- insurance
- electrical power
- water and sewage
- heat
- fuel
- miscellaneous services
- residual disposal

Lease vs. Purchase on Balers A five year lease lowers the initial capital outlay by $166,600, but increases the processing costs by $39,292 per year (or $196,461 over five years).

Lease vs. Purchase on all Equipment (balers, roll-off truck, ferrous separator and conveyors). A five year lease on all equipment lowers initial capital outlay by $306,600, but increases the annual processing expenses by $72,296 (or $361,480 over five years).

If lease baler, the MRF will have a projected:

- initial capital cost of $407,900
- annual processing costs of $369,292

If lease all the equipment, the MRF will have a projected:

- initial capital cost of $268,500
- annual processing cost of $402,296

Projected Revenues and Reduced Expenses for District and the City Under Scenarios Where the Equipment is Purchased and Leased – Equipment Costs Recouped in No Later than Three Years

The Report estimates that the cost of equipment would be recouped in no later than three years in good as well as bad market conditions.[2]

It further notes that the City and District would need to negotiate fees for processing the additional materials and possible profit-sharing.

INTERVIEW WITH OTHER MRFs

The Report summarizes interviews conducted with nine other MRFs in the State. They included:

- Bartholomew County SWMD
- Posey County SWMD
- Spenser County SWMD
- City of Vincennes and Knox County SWMD
- Brown County SWMD
- Dearborn County SWMD
- Northwest Indiana SWMD (including Benton, Carroll, Jasper, Newton, Pulaski & White Counties)
- Martin County SWMD, and
- City of Seymour Recycling.

It is useful in elaborating upon:

- The population and tonnage of recyclables;
- Items that are recycled;
- Number of collection sites and whether the materials are sorted or unsorted;
- The amount of equipment and staff needed to operate the program; and
- General advice.

[2] The Report projects a range of revenues from District recyclables in a stable market (with a mid-value of $315,000) and in a downturn (with a mid-value of $183,000). It does the same analysis for City, where revenues would be $340,000 in a stable market and $195,000 in a downturn. It then accounts for the reduction in current annual costs for the District ($200,000) and for the City ($118,000). *Please note that Susie Johnson believes this figure is closer to $48,000.* Lastly, it subtracts the annual processing costs for District and City. This formula is applied to stable and down markets as well as to when the equipment is purchased ($330,000) and leased ($402,296).

BEST PRACTICES

Balers – prices range from $166,768 to $280,000. Vendors and some of the MRFs say Excel balers are cheaper and better. Excel provided a precise quote and offered a 1-2-3 Year Warranty. Balers would be set up in a manner "optimally suited" to handle 20-30 tons per day.

Baler Contracts – preventative maintenance is not expensive; emergency maintenance can be if mechanic must travel far to the site. Some vendors offer contracts in exchange for exclusive marketing rights.

Impact of balers on space for "tipping floor" – balers compact recyclables and, therefore, are useful for saving space in the area where trucks tip their loads. Plastic bags take up more space than other recyclables.

Square footage needs – 66,000 sf is more than the 30,000 sf MCSWMD would initially need, but more generally is better.[3]

Layout of Truck Bays and Loading/Unloading Strategies – in most MRFs trucks drive into a large, open room and dump their material. If the material needs further sorting, then a "skid lift" loads it into a feeder for a sort line. One MRF collects containers that can be moved and dumped into the correct sort line. In general, MRFs must:

- provide space for forklifts with bales to maneuver;
- minimize distance between tippling floor and unloading area; and
- minimize distance bales are carried.

[3] Space needs are broken down into:

- number of days material would stay in the tipping floor - either two days (5,000 sf) or three days (6,000 sf));
- space to process (13,000 sf); *Note: a large, open space allows MRFs to operate in a cleaner and organized manner, thereby, reducing contamination and increasing efficiency)* and
- number of weeks commodities would be stored - one week (2,700 sf), two weeks (5,400 sf), and four weeks (11,000 sf). *Note: more space allows the MRF to wait out low points in the market.*

Automation vs. Labor – The Handbook: Material Recovery Facilities for Municipal Solid Waste provides standards that recommend 8-12 staff for a facility of this size (30 tons per day) and design. The current proposal for eight staff - five sorters, three baler operators, and one foreman – was considered low by many of the manufacturers of sorting equipment for a facility processing 30 tons per day. Investment in equipment – a ferrous separator, non-ferrous separator, and perhaps a heavy-light separator – could make the proposed staffing level feasible.

Ferrous Separation (steel) – this type of device costs about $35,000 (plus installation) and uses a magnet to draw out the steel and achieves a 95%-98% rate of recovery. It cannot be effectively replaced by manual labor because it is difficult to distinguish between steel and aluminum.

Non-ferrous separation (aluminum) – aluminum is separated by an "eddy current" process "installed at the end of the sorting line." It costs about $75,000 and achieves a 95% rate of efficiency.

Heavy /Light Separation (separate glass from plastic) – There are two approaches to separating glass from plastic:

- a glass breaker screen costs about $55,000 and breaks the glass into fine particles and recovers about 95% of the glass;
- a conventional heavy/light separator costs about $125,000 and does a better job of separating the glass, but takes up more space.

Hiring Additional Sorters Instead of Some Equipment – additional sorters could replace the need for non-ferrous (aluminum) and glass/plastic sorting equipment at an additional cost of $60,000/year.

COST ASSESSMENT REPORT

Capital Costs for MRF - $574,000 to $774,000			
Item	Elaboration	Cost for Item	Sub-Total/Total
Retrofitting Property		$251,272	
Bailing Equipment	Baler, conveyor belt, shipping and installation	$166,768	
Additional Installation Costs	Installing pits and electrical hook-ups	$16,000	
Additional Equipment	Roll-off truck, sorting conveyors,	$140,000	

	and ferrous separator and conveyor		
		Sub-total	$574,040
Optional Sorting Equipment	Non-ferrous, eddy-current separator (for aluminum) and heavy (glass) / Light (plastic) separator	$200,000	
		Total	$774,500

Leasing to Reduce Capital Costs – Excel EX 63 Baler / All Equipment - Five Year Horizon – The Report compares the cost of buying the baler outright versus leasing it over three, four, and five years. As would be expected, paying for it upfront raises the initial costs, but leasing it over time increases operating as well as total costs. In particular, the Excel EX 63 Baler would cost $166,600 to buy outright versus $183,586 to lease for three years (at an annual cost of $61,195), $190,004 to lease for four years (at annual cost of $47,501), and $196,416 to lease over five years (at annual cost of $39,292).

Current Recycling Operations – Annual Costs and Revenues		
		Subtotal and Total
Transportation by Hoosier	$10,000/month or $120,000/year	
Processing Recyclables	$123,000/year	
		$243,000
Revenue from Sale of Recyclables	- $29,000	
Total Cost		$214,000
** The Report estimates that the City paid $118,000 for recyclables to be hauled and processed, but Susie Johnson estimates that figure is closer to $48,000.*		

Proposed Recycling Operations – Annual Costs and Revenues		
Transportation	$6.50/hour for truck for 30 hours/week and 50 weeks/year = $19,750 and $25.9/hour for driver for 1,500 hrs a year = $38,850	$58, 600
Facility Costs	Including maintenance, insurance, power, water and sewage, heat, fuel,	$63,500

	other services, and residual disposal	
Lease of Building		$120,000
Staff	Additional three unskilled workers. *	$87,600
Total		$330,000
** Note: There are already five employees already on staff - a foreman, two baler operators, and two unskilled labor – with a payroll totaling $172,496.*		

Potential MRF Revenues

The primary fiscal gain from operating a MRF and the current district operations is that the District is able to sell the material as a commodity rather than merely pay for its disposal. The Report estimates that the MRF can receive between $90 - $125/ton for the recyclable materials in a stable market and between $50-$75/ton in a downturn (as happened once in the last 5 years – 2009).

MRF Recycling Revenues and Costs – Potential Savings to District of $200,000 per Year - At an estimated 2,930 tons per year, the District could receive between $263,700 and $366,250 each year with a mid-value of $315,000. Assuming annual costs of $330,000 and revenues of $315,000, the District would operate the program at a deficit of $15,000. This deficit is significantly less than the $215,000 the District currently expends to operate the recycling program and would, therefore, offer savings of $200,000 per year. Even in a downturn in the market, the Report indicates that the District would receive between $146,500 and $219,750 each year, with a mid-value of $183,000. That lower figure would yield an operating deficit of $147,000, which still is lower than the current deficit of $215,000.

The City's Possible Role in the MRF - The Report briefly discusses the possible role the City might play in the MRF. First, it estimates that at 3,120 tons/year and the same price/ton noted above, the revenue from the City's recyclables could be between $288,800 and $390,000 a year, with a mid-value of $340,000, in a stable market and between $156,000 - $234,000, with a mid-value of $195,000 in a downturn. Second, it estimates that the City pays $118,000 for disposing of recyclables each year. *Susie Johnson, however, estimates that, through an arrangement with Republic/Hoosier whereby the City doesn't pay for disposal of all its recyclables, the City pays about $48,000 a year for that service.*

With those numbers in mind, the Report estimates that there is a potential gain of $458,000 in cooperation between the City and the District during a stable market and $313,000 during a downturn. Given Susie's more accurate estimate of current cost of disposing of recyclables, the potential gain should be lowered by $70,000 ($118,000- $48,000).

The possible participation by the City could, in general, take one of the following forms. The City could:

- give the recyclables to the District without fee;
- pay a small gate fee for dropping the recyclables off at the MRF;
- sell the recyclables to the MRF; or
- enter into some form of a profit-sharing relationship with the District if (and the extent to which) the City were to:
    - help with capital expenditures,
    - bear part of the operating costs, or
    - otherwise provide resources to the MRF. *Note: Although the Report does not mention it directly, another factor in any profit-sharing arrangement would be the City's exposure to loss in the event the operation fails or does not meet expectations.*
        - The "profit' in profit sharing typically is derived from the type and volume of recyclables, the cost to process the material and the revenue received from its sale.

Further Cost Reducing Opportunities

The Report suggests that adding to the "recycling stream could significantly increase revenue while only minimally impacting cost." *This assumes that the additional material can be handled by the proposed staff and equipment. Here, the combined recycling stream from the District and the City (~6,000 tons per year) approaches the optimal handling capacity of the proposed staff and equipment (6,500 tons per year if processing 25 tons per day, five days a week and fifty-two weeks a year). At one point, the Strategic Planning Report mentions using a second shift to handle additional volumes.*

Although there are challenges, Indiana University offers an "opportunity for a large-scale collaboration, best estimated at 2,000 tons/year." Those challenges are due to the disparate and multiple manner in which recycling is currently handled on campus. Given the unlikelihood of any imminent action to unify the campus recycling streams, the Report does suggest opportunities for working with entities

within the campus – like the IMU – which have the means to centralize and sort recycling materials.

Other counties might be enticed to bring their recyclables to the District MRF by offering a profit -sharing arrangement.

Additional Advantage to MRF

The Report presents three additional advantages to having a MRF in the community. The MRF would:

- Reduce the carbon footprint of the community by reducing fuel for trucks by a factor of 10 (by compacting the material before its transported out of town);
- Assure recycling material is recycled rather than land-filled because the MRF and not a private company would control where the material went;
- Move the community a step forward toward sustainability by helping to reduce waste and increase the efficient processing of waste.

The Marketing of Materials

Options	Important Considerations			
	Provides Regular Revenues	Optimizes Price	Requires Additional Storage	Other
# 1 - Market and Sell Each Truckload as Soon as that Quantity is Acquired				
	Yes	No	Yes – sometimes there's no buyer for glass	Works well for selling aluminum
# 2 – Monitor Markets and Wait for Favorable Offers				
	No.	Yes – if have expertise.	Yes – same as above	
# 3 – Contract with Specific Vendors on an Annual Basis				
	Yes.	No.	No – vendor takes it.	Works well for glass.
# 4 – Enter Exclusive Contract with One Vendor for All Materials				
	No.	No	No – vendor takes it.	Vendor has vested interest in MRF

NOTICE AND AGENDA
BLOOMINGTON COMMON COUNCIL SPECIAL SESSION
7:30 P.M., WEDNESDAY, JULY 7, 2010
COUNCIL CHAMBERS
SHOWERS BUILDING, 401 N. MORTON ST.

I. ROLL CALL

II. AGENDA SUMMATION

III. APPROVAL OF MINUTES FOR: June 30, 2010 (Regular Session)

IV. REPORTS

Monroe County Solid Waste Management District (District) Update

District Strategic Planning Report (April, 2010) – Prepared by Strategic Development Group, Inc.

District Materials Recovery Facility Cost Assessment (June, 2010) – Prepared by Strategic Development Group, Inc.

Asked to attend: Larry Barker, District Director
Brian O'Neil, Strategic Development Group, Inc.
Patrick O'Neil, Strategic Development Group, Inc.
Susie Johnson, Director, Public Works

IX. ADJOURNMENT

Posted & Distributed: Friday, July 2, 2010

City of Bloomington
Office of the Common Council

To: Council Members
From: Council Office
Re: Calendar for the Week of July 5-10, 2010

Monday, July 5, 2010

City Holiday: Independence Day – Offices Closed.

Tuesday, July 6, 2010

1:30 pm Development Review Committee, McCloskey
4:00 pm Bloomington Community Farmers' Market, Madison St, Between 6th & 7th St
5:00 pm Utilities Service Board, Board Room, 600 E Miller Dr
5:30 pm Board of Public Works, Council Chambers
7:30 pm Telecommunications Council, Council Chambers

Wednesday, July 7, 2010

9:00 am Monroe County Emergency Management, Council Chambers
12:00 noon Bloomington Urban Enterprise Association, McCloskey
5:30 pm Commission on Hispanic and Latino Affairs, McCloskey
7:30 pm Common Council Special Session, Council Chambers

Thursday, July 8, 2010

12:00 noon Housing Network, McCloskey
4:00 pm Bloomington Historic Preservation Commission, McCloskey
4:00 pm Solid Waste Management District, Monroe County Courthouse, Judge Nat U. Hill, III Room

Friday, July 9, 2010

No meetings are scheduled for this date.

Saturday, July 10, 2010

8:00 am Bloomington Community Farmers' Market, Showers Common, 401 N. Morton

Posted and Distributed: Friday, July 2, 2010

401 N. Morton Street • Bloomington, IN 47404 **City Hall** **Phone: (812) 349-3409 • Fax: (812) 349-3570**
www.bloomington.in.gov/council
council@bloomington.in.gov

District Update

Larry D. Barker

Executive Director

Solid Waste Management District

"20th Year Anniversary"

July 7, 2010

What's Changed

- New hours of operation
- Recycling Commodities (Glass & Plastic)
- Electronics
- Bulky Item Days
- Citizens Advisory Committee
- Educational Outreach
- Material Recovery Facility (MRF) Study

New Hours of Operation

- We changed our hours of operation at Central Station Recycling, 3400 S. Walnut to 7:30 – 5:30 Tuesday-Saturday.
- This change took place to provide more access to our facility for the working public.

Recycling Commodities

- All District recycling sites now accept plastics #1-#7, same as the City of Bloomington.
- Glass is now being marketed to Strategic Materials INC of Indianapolis.

Electronics

- The District has signed a new contract for electronic recycling with Electronics Recycling International (ERI) for unlimited tonnage.
- The electronic recycling is now only $1 per cost item.

Bulky Item Days (BID)

- Spring BID was a total success with over 114 tons of waste (up 43 tons from 09), 15 tons of scrap metal (up 4.6 tons from 09) and approximately 9 tons of reuse materials (up 4 tons from 09) were collected during the two day event. We estimated that 1200 residents participated.
- Fall BID is scheduled for October 8-9 at the Fairgrounds / Highway Garage.

Citizen Advisory Committee

- Will be releasing a Restaurant and Bar Survey soon. It is designed to gauge the volume of recycle commodities.
- There are a few vacancies on the committee so applications are welcome.

Educational Outreach

- Over 270 educational presentations yearly reaching 7,168 students.
- 14 infomercials on cable TV and weather crawl.
- Provide tours of Central Station and Wasteline Education Park.
- Community outreach programs.

Material Recovery Facility

- Strategic Development Group has completed an in-depth study of the feasibility that shows our community can support a MRF.
- A MRF operation is a move in the right direction for the City and Monroe County, not only for finances but also sustainability.
- SDG is ready to present the study to the City Council upon request.

Questions

Monroe County Solid Waste Management District

Strategic Planning Report

April 2010

Prepared by
Strategic Development Group, Inc.
2901 N. Walnut Street
Bloomington, IN 47404
800-939-2449
www.sdg.us

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Table of Contents

Introduction

The Monroe County Solid Waste Management District (the district) recently examined a proposal by Executive Director Larry Barker for a new Materials Recovery Facility (MRF). This Strategic Planning Report seeks to identify the present state of the district's operations and infrastructure, as well as consider the possible impacts of constructing an MRF.

The findings of this Strategic Planning Report incorporate analysis of policy documents, news articles, and interviews with key informants. Nearly thirty key informants were contacted in the course of this Strategic Planning Report. The individuals identified as key informants came from the City of Bloomington, the district, Indiana University, solid waste transport service providers, recycling programs, and other cities and towns. A total of seventeen key informants provided interviews, and they are identified in the following section.

Firstly the overall costs of recycling and garbage disposal are determined. Next, national and local market data for recyclables is reviewed and analyzed, and its relevance to the district's current position and future planning are assessed. Neighboring programs are assessed to examine if the district's costs are typical for the region. A catalog of the available solid waste transport service providers and vendors purchasing recyclable materials in the local area is formed.

The district's current pay structure for solid waste services is explained, including the costs and benefits of Pay-As-You-Throw (PAYT) systems. An analysis as to how much people are charged for PAYT and why is conducted concluding that PAYT funds only garbage disposal itself in the district and does not subsidize the cost of recycling, which is therefore funded entirely though taxation. The present economic sustainability of the district is assessed and strategies to remain economically sustainable in the future are determined.

A specific explanation of the concrete, environmental values of recycling is presented, followed by a discussion of possible future directions for the district's own recycling program. With this information in place, the possible costs and benefits of creating a MRF in Monroe County as per Executive Director Larry Barker's proposal are analyzed, including key principles of MRF design that allow MRF implementations to succeed long term.

Recommendations are made for how the district can best move forward.

Executive Summary

The Monroe County Solid Waste Management District (the district) is seeking to increase its efficiency in managing recycled materials. A possible venue for this increase is Executive Director Larry Barker's proposal for the creation of a Materials Recovery Facility (MRF) in Monroe County to bale and store recyclable materials. The cost, value, and logistics of such a project are analyzed in this report. Other possible methods for increasing the district's efficiency are also explored.

Some of the opportunities for the district can be considered low-cost or possibly no-cost. Outreach programs have been found to have great importance in affecting a community's values and recycling behaviors. The following report explores several innovative outreach programs such as one in Vincennes that hosts field trips for elementary school students to visit local recycling facilities and also an elaborate volunteer service program in which military personnel go door to door in Virginia helping people understand their recycling program and encouraging participation. Collaboration also offers an opportunity to increase efficiency. Members of the Indiana University community, including Gary Chrzatowski at the Indiana Memorial Union (IMU) and Steve Akers at Residential Programs and Services (RPS), expressed interest in collaborating with the district's recycling program, especially if the district elects to build a MRF.

Ultimately a solid waste management strategy must be long term. Environmentally, landfills are not renewable. Economically, the recycling market fluctuates rapidly and its present state bears little implication on the future. When determining policies it is important to consider long term progress towards sustainability in addition to creating a solution that works to solve immediate concerns.

To become sustainable, infrastructure improvements such as the proposed MRF or other advancements must be made step-by-step. It is not possible to become a fully sustainable community overnight, nor is it possible to become a sustainable community without pursuing a plan for sustainability over a long period of time. The Goldilocks' Principle applies thusly: communities must actively pursue sustainability and environmental improvement for it to occur, but communities must also ensure that the pursuit of sustainability is not so aggressive as to prove unsustainable itself.

The recommendations provided at the end of the report are intended to help the district maximize both its environmental impact and its cost-efficiency.

List of Key Informants

Stephen P. Akers, Associate Director of Environmental Operations
Indiana University, Residential Programs and Services

Melinda Antell, Area Manager
Recycling Division, Abitibi Bowater, Inc.

Brendon Baatz, Sustainability Intern
Indiana University Office of Sustainability

Larry Barker, Executive Director
Monroe Co. Solid Waste Management District

Steven Boggs, District Grant Manager
IDEM – Office of Pollution Prevention and Technical Assistance (OPPTA)

Gary Chrzatowski, Operations Manager
Indiana Memorial Union

Calvin Davidson
Ray's Trash Service

Jarrod Evans, Vice President
Quincy Recycle Paper, Inc.

Mitch Jernigan, Operations Manager
Southeastern Public Service Authority (SPSA) of Virginia

Susie Johnson, Public Works Director
City of Bloomington

Shirley McMurry, Controller
Monroe Co. Solid Waste Management District

Scott Morgan, Operations Director
Monroe Co. Solid Waste Management District

Matt Otte, Director of Recycling
City of Seymour

Benjamin H. Pedigo, Recycling Sales Manager
Rumpke Recycling

Brenda Strauss, Director of Human Resources
Monroe Co. Solid Waste Management District

Steve Volan, Bloomington City Councilman
Monroe Co. Solid Waste Management District, Executive Board Member

Shelby Walker, Director of Sanitation and Recycling
City of Bloomington

CURRENT PROGRAM ANALYSIS

OVERVIEW OF ASSETS

The expenses of the Monroe County Solid Waste Management District (the district) associated with municipal solid waste and recycling are sorted into two departments: the department 04 2009 budget accounts for expenses for the recycling and reuse center (3400 South Walnut, Bloomington) and the department 06 2009 budget accounts for the cost of operating the four rural drop-off sites for garbage and recycling that are pictured below.

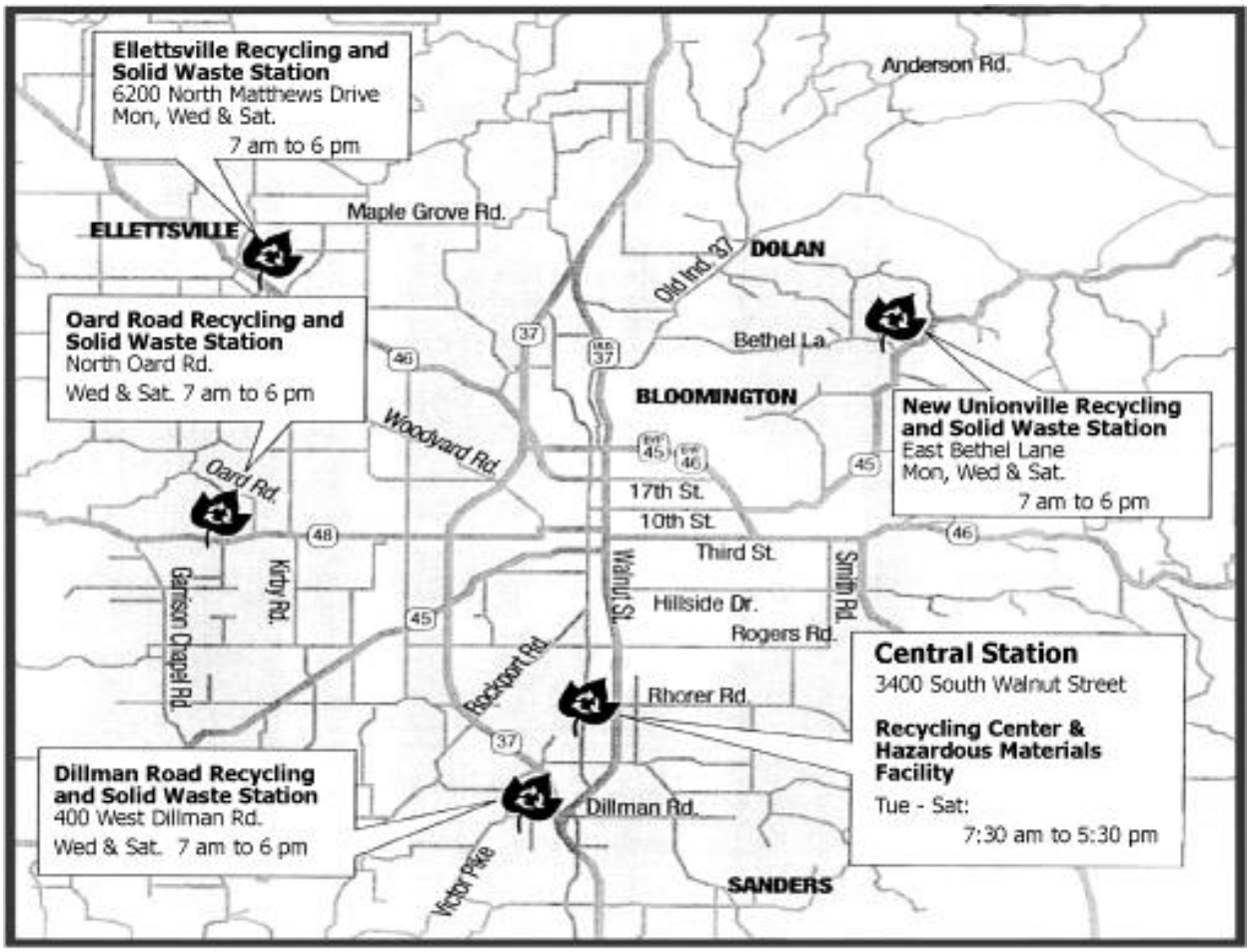


Image courtesy of MCSWMD.

The annual operating budget of the recycling center was $402,000 for 2009; $272,000 (67.7%) of which were personnel costs (salaries, wages, and benefits). The recycling center has $496,000 in assets with an accumulated depreciation of $394,000, giving a present value of $101,000.[1]

[1] MCSWMD Department Actual & Budget Expenditures Report #4 2009, MCSWMD Asset Status Report

The annual operating budget of the rural stations was $458,000; $100,000 (21.8%) of which were personnel costs. The rural stations have $282,000 in assets with an accumulated depreciation of $220,000, giving a present value of $62,000.[2]

EXPENSES AND INCOME

The total expense of the garbage and recycling programs for the district was $860,000 in 2009. Sources of income are shown in the table below for 2009.

District Sources of Income (Departments 04 and 06: 2009)	
SOURCE	*INCOME*
County Property Taxes	$759,000 (estimate)
Vehicle License Excise	$59,000 (estimate)
Commercial Vehicle Excise	$5,000 (estimate)
Pay-Per-Use Bag Fee	$257,000
Green Business Members	$31,000
Sale of Recyclables	$34,000
Glass Recycling	$0 – estimated to increase to $28,000 for 2010

REMOVAL OF MUNICIPAL SOLID WASTE

Tipping fees represent the cost of dumping garbage in a landfill per ton. In 2009, the district paid a tipping fee of $41.86 for 2,288 tons of garbage, a total cost of $96,000 to pay for the landfill space for the district's 2009 garbage.

In addition to tipping fees, the district has to pay a transportation fee for each trip a garbage hauler must make (each trip is called a "pull"). The cost for each pull varies depending on which of the five garbage collection sites (shown on the previous page) primarily due to their distance from the landfill. As shown below the district had a total of exactly 400 pulls for garbage in 2009, costing $49,000.

Transportation Fees for Municipal Solid Waste (Departments 04 and 06: 2009)		
TOTAL PULLS	*PER PULL COST*	*TRASH COST*
102	$122.13	$12,457.26
103	$85.71	$8,828.13
101	$159.74	$16,133.74
10	$104.54	$1,045.40
84	$122.13	$10,258.92
400		**$48,723.45**

When the transportation cost is divided to figure out how much it costs per ton, the value is $21.29. When added to the tipping fee, the total expense of removing a ton of garbage from the district in 2009 becomes $63.15, with a total municipal solid waste cost of $145,000 throughout the year.

[2] MCSWMD Department Actual & Budget Expenditures Report #6 2009, MCSWMD Asset Status Report

Total Cost of Municipal Solid Waste (2009)	
2009 Transportation Fee Per Ton of MSW	$21.29
2009 Total MSW Costs Per Ton	$63.15
2009 Total MSW Cost	$145,000

RECYCLING STREAMS

In 2009, the district collected a total of 2,930 tons of recyclables. They are broken down by commodity in the table below. Hoosier disposal charges a processing fee for each ton of recyclables they handle, which varies by commodity. The processing fees are listed in the table below both by ton and for the 2009 total.

Recycling Tonnage and Processing Fees (2009)			
2009 TOTAL RECYCLING	*TONNAGE*	*PROCESSING FEES*	*TOTAL PROCESSING FEES*
Cardboard	743	$54/ton	S40,100
Mixed Paper/Magazines	216	$54/ton	$11,700
Newspaper	548	$54/ton	$29,600
Books	40	$54/ton	$2,200
Sorted Office Paper	35	$54/ton	$1,900
Scrap/Steel	164	$0/ton	$0
Aluminum Cans	45	$0/ton	$0
Glass	707	$41/ton	$29,000
Plastic 1 & 2	219	$38/ton	$8,300
TOTAL	**2,930**		**$123,000**

Just as with garbage, the transportation of recycling is also a fee and is measured by how many trips (or pulls) must be made to collect the recyclables. In 2009, the district had 1,017 loads of recyclables hauled away at a transportation cost of $121,000. This is $41.13/ton and means that under the current contract hauling recyclables is far more expensive than hauling garbage.

Transportation Fees for Recycling (2009)		
TOTAL PULLS	*PER PULL COST*	*RECYCLING COST*
150	$ 122.13	$18,319.50
134	$ 85.71	$11,485.14
199	$ 159.74	$31,788.26
311	$ 104.54	$32,511.94
36	$ 99.00	$3,564.00
187	$ 122.13	$22,838.31
1,017		**$121,000.00**

In addition to the cost of the recyclables there is also the benefit of being able to sell the scrap to manufacturers who will reuse it. In 2009, **$29,000** was received from the sale of recyclables by the district.

The revenue generated from the sale of recyclables in 2009 was lower than anticipated for two reasons: **1)** a delay in collection of recycling income caused the value of the recyclable sales to appear lower because not all of the income was collected in 2009, and **2)** the strong market crash at the end of 2008 meant that the market was at bottom value during the beginning of 2009 and remained low through much of the year.

It is anticipated that the district will collect increased revenue in 2010 from the sale of recyclables.

TOTAL EXPENSE IN PROCESSING OF RECYCLABLES

There are two expenses in processing of recyclables: processing fees (per ton) and transportation (per pull). Some of the expense is recouped by the sale of recyclables. The total cost of processing of recyclables is $73/ton.

= + [Processing of Recyclables] + [Transport of Recyclables] – [Sales of Recyclables]
= + $121,000 + $123,000 - $29,000

= $215,000
= $73/ton

This cost is greater than the expense of landfilling one ton of MSW:
= $73/ton - $63/ton
= $10/ton more expensive than landfilling

This indicates that the cost of processing of recyclables instead of throwing that same material into a landfill is $10/ton, and indicates that currently the district could save $10 per ton of material they chose to landfill instead of recycle. This is unusual, as recyclables do have a market value (whereas garbage, obviously, does not).

Even the deflated sale of recyclables figure cannot account for this value. In a better market and with the full value of recyclable sales the cost would be estimated at about $10/ton less – still costing the district $63/ton and an approximately equivalent amount as sending waste to the landfill.

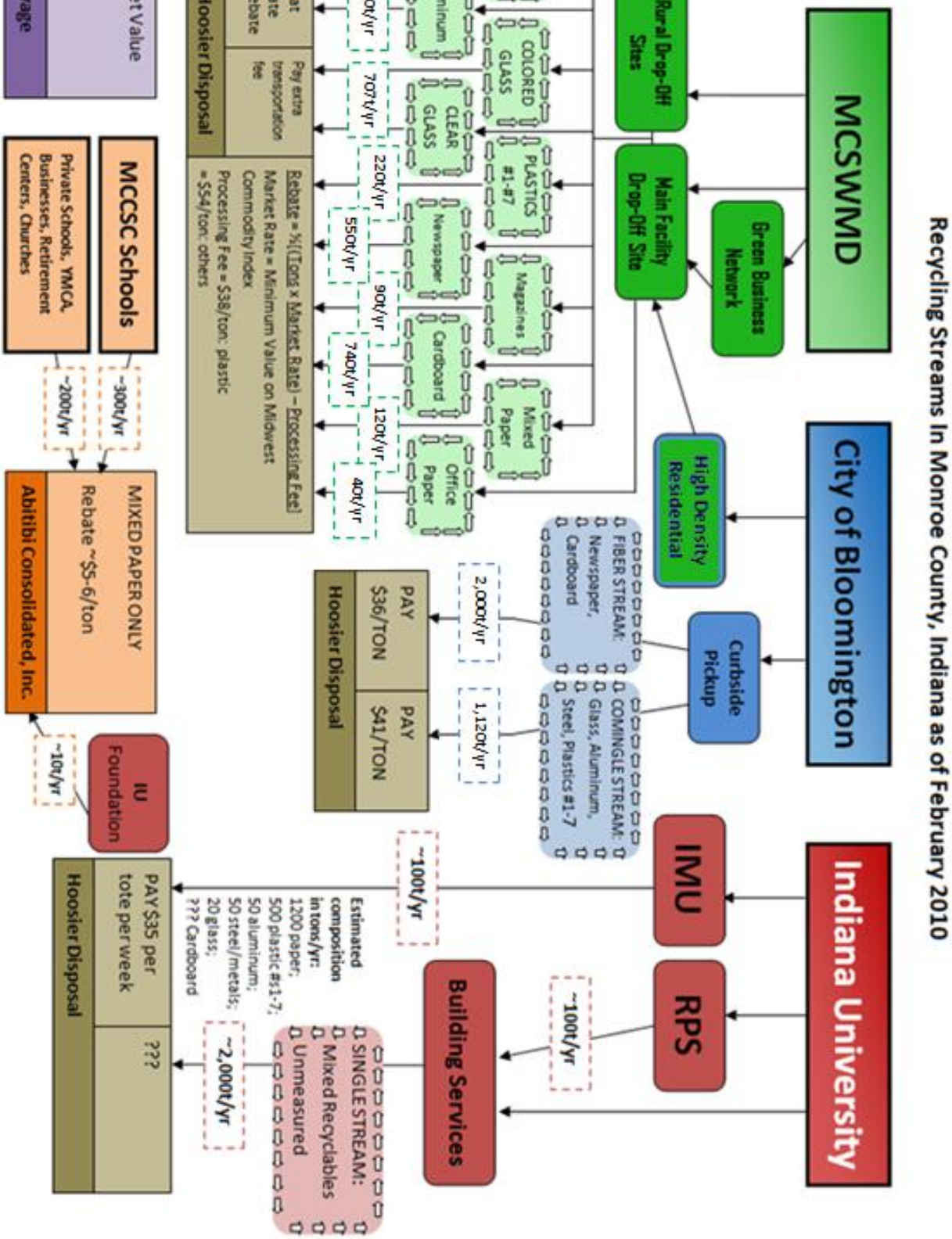
FATE OF RECYCLABLES

After the sale of recyclables to a company, that company may choose either to recycle the materials or dump them in a landfill. During slumps in scrap prices, companies may opt to landfill their recyclables in order to protect their employees and best serve their shareholders.[3] Many cities and towns have a

[3] NY Times12/08/2008; Indianapolis Business Journal 01/19/09; News&Observer 12/26/2008

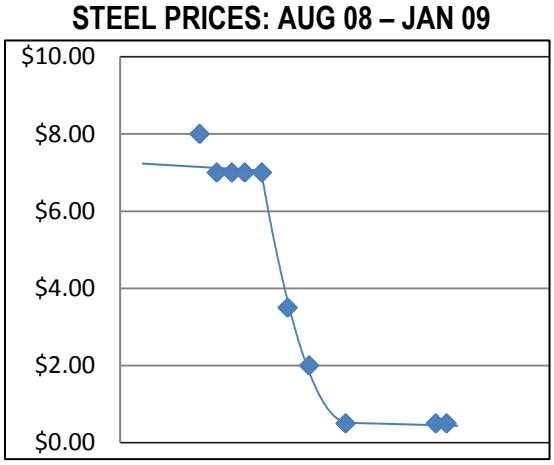
clause requiring that recyclable material be recycled – a clause that is acceptable to many companies including local waste haulers Hoosier Disposal[4] and Rumpke.[5] Without such a clause, some recyclable materials may end up in landfills.

[4] Bloomington Alternative 08/10/08
[5] Ben Pedigo Interview


Recycling Streams In Monroe County, Indiana as of February 2010
MCSWMD
Rural Drop-Off Sites
Green Business Network
Main Facility Drop-Off Site
STEEL
COLORED GLASS
CLEAR GLASS
Aluminum
PLASTICS #1-#7
Newspaper
Magazines
Cardboard
Mixed Paper
Office Paper
160t/yr
50t/yr
707t/yr
220t/yr
550t/yr
90t/yr
740t/yr
120t/yr
40t/yr
Hoosier Disposal
Flat Rate Rebate
Pay extra transportation fee
Rebate = %((Tons x Market Rate) – Processing Fee)
Market Rate = Minimum Value on Midwest Commodity Index
Processing Fee = $38/ton; plastic = $54/ton; others
Market Value
JB Salvage
MCCSC Schools
Private Schools, YMCA, Businesses, Retirement Centers, Churches
~300t/yr
~200t/yr
MIXED PAPER ONLY
Rebate ~$5-6/ton
Abitibi Consolidated, Inc.
~10t/yr
IU Foundation
City of Bloomington
High Density Residential
Curbside Pickup
FIBER STREAM:
Newspaper, Cardboard
COMINGLE STREAM:
Glass, Aluminum, Steel, Plastics #1-7
2,000t/yr
1,120t/yr
PAY $36/TON
PAY $41/TON
Hoosier Disposal
Indiana University
IMU
~100t/yr
Estimated composition in tons/yr:
1200 paper;
500 plastic #s1-7;
50 aluminum;
50 steel/metals;
20 glass;
??? Cardboard
RPS
~100t/yr
Building Services
SINGLE STREAM:
Mixed Recyclables
Unmeasured
~2,000t/yr
PAY $35 per tote per week
???
Hoosier Disposal

THE NATIONAL MARKET

The national scrap market suffered a remarkable crash at the end of 2008. The crash in the national recycling market is a result of the economic recession affecting the world economy, as during this time of low production neither foreign nor domestic markets have a significant demand for scrap. The graph on the right roughly traces the value of steel from late August 2008 to early January 2009 and is highly characteristic of the entire scrap market, which crashed from an all-time high at the beginning of September 2008 to about 5-20 percent of that value (pending which commodity is examined) in less than 2 months. This crash was especially sharp because market value was at a record high prior to the crash.



Across the nation a number of different headlines appeared regarding the current scrap market bust; although at first glance one would think they must not be covering the same market. From basic descriptions of the bust ("Recycling Market Crumples Like Can"[6] or "Recycling Business Goes from Boom to Bust"[7]) to articles suggesting recycling may be a thing of the past until our economy recovers ("Plunging Scrap Prices Wreak Havoc On Recycling Industry"[8] or "State Cuts Off Aid for Recycling"[9]) to articles optimistic that the plummeting economy won't affect recycling infrastructure ("Local Recycling Surviving Amid Market Collapse"[10] or "IDEM Cuts Won't Affect Jackson County's Recycling Programs"[11]). These varying articles reflect the vast range of interpretations and responses to the crash of the recyclables market.

	COPPER SCRAP	*ALUMINUM SCRAP*	*PLASTIC BOTTLES*	*SCRAP IRON*	*CORRUGATED CARDBOARD*
2008 HIGH	$7,660	$2,845	$560	$500	$130
JAN 2009 PRICE	$3,158	$1,545	$45	$100	$20

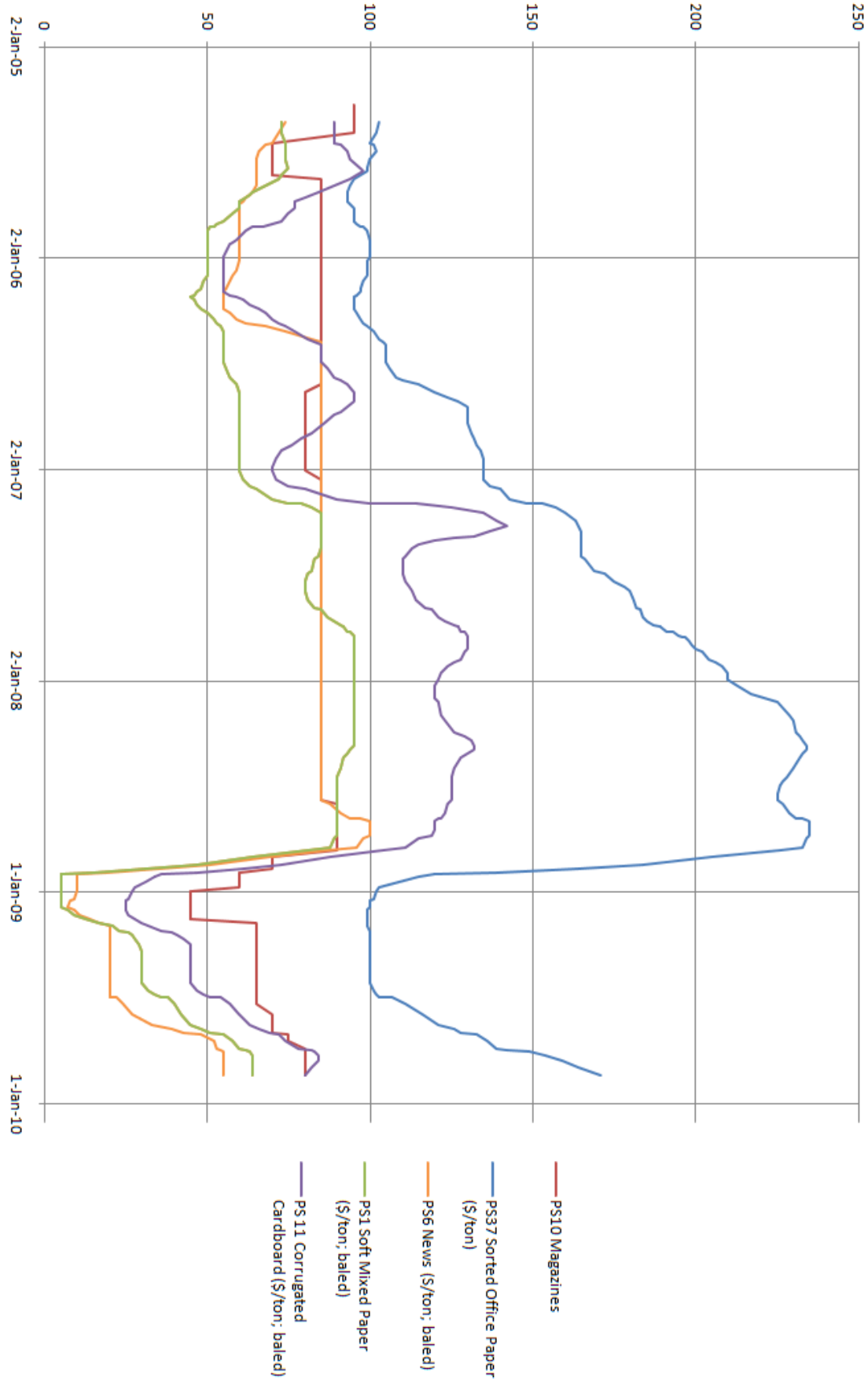
Source: Indianapolis Business Journal Research, January 18, 2009

True to the turbulent nature of the recyclables market, significant recovery has already occurred since the crash. The next three pages contain graphs depicting the Midwest market values of the recycling streams for the district's recyclables (excluding glass, for which local market offers vary so greatly that aggregate measures can be misleading). The most striking feature of all three graphs is the market crash at the end of 2008. As the graphs show, as of November of 2009 most recyclables are at a value that is similar if not higher to the average value from 2005-2007, before the record highs in 2008. In fact, some streams like sorted office paper now have a higher value than they ever had with the exception of the 2008 values.

[6] News&Observer 12/26/2008
[7] Chicago Tribune 12/23/2008
[8] Indianapolis Business Journal 01/18/2009
[9] Indianapolis Star 01/01/2009
[10] Edison/Metuchan Sentinel 12/23/2008
[11] Seymour Tribune 01/01/2009

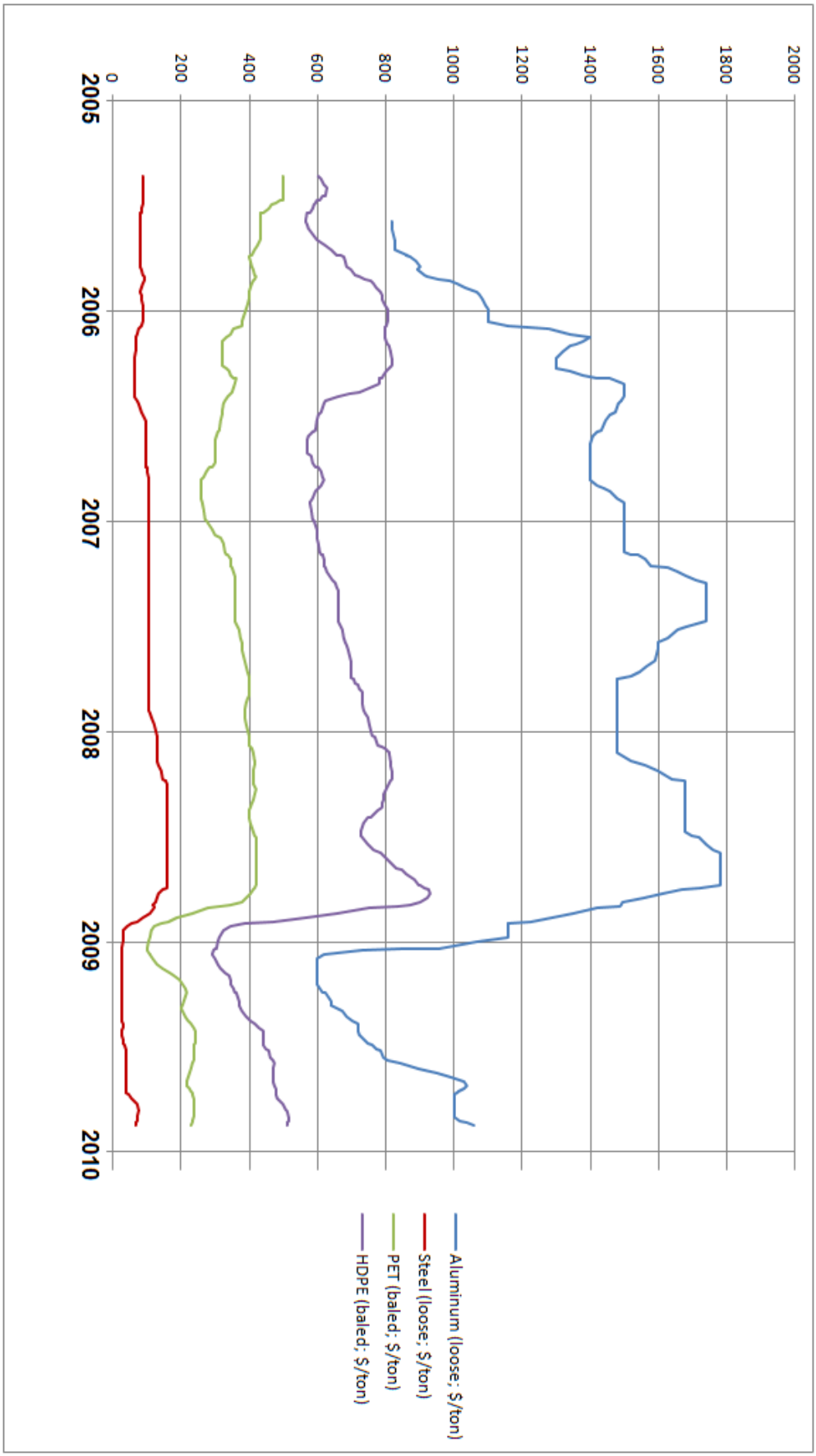
Midwest Market Values: Fiber Streams From April 2005 – November 2009

Reported By Waste and Recycling News in November, 2009



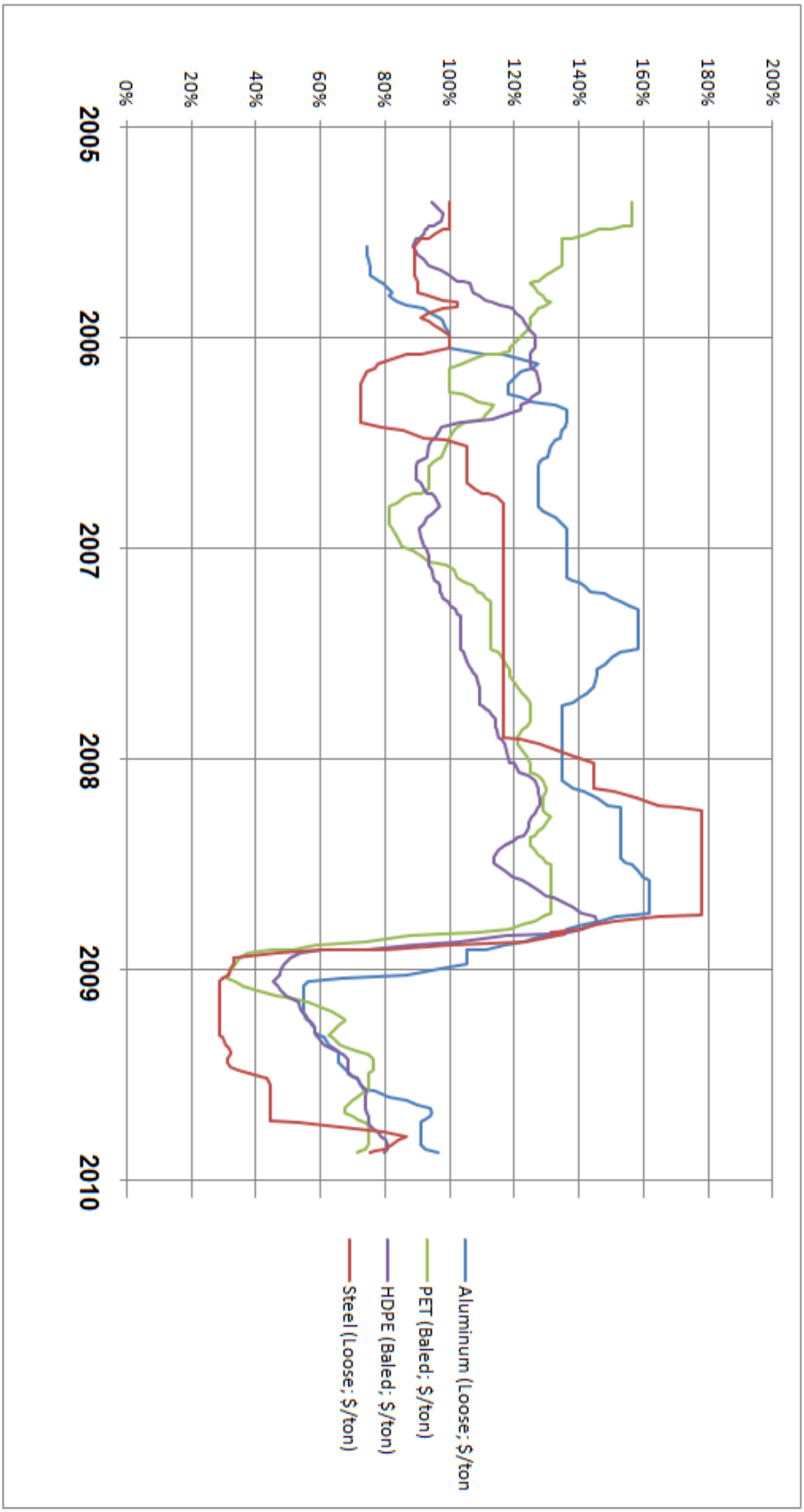
Midwest Market Values: Metals and Plastics April 2005 – November 2009

Reported By Waste and Recycling News in November, 2009



Adjusted Market Values – Values are scaled in order to overlay for comparison

Reported By Waste and Recycling News in November, 2009



The most important pattern to recognize in the graphs of commodity market values is the extreme fluctuation of prices. It is not at all uncommon for a commodity's value to change by 30% or more in a single month. The massive crash of 2008 was not without impact but was short term as the market displayed nearly a full recovery in less than one year. It is tempting to use the high values of 2008 as the new expectation for the recyclables market, but these values were a one of a kind high in the same way that the ensuing crash was a one of a kind low. The programs that survived the recycling market crash best were the ones that saved the extra income from the 2008 highs in preparation for when the market would be worse.

Although the commodities market is unpredictable it does tend around a central point; neither the high of 2008 nor the crash of 2009 lasted long enough to make or break a strategy for a recycling program. But some programs were broken – either by irresponsible expansion that was only sustainable with the assumption that the market highs of 2008 were the new rule or by an overreaction to the market bust at the end of 2008.

CONSEQUENCES OF NATIONAL MARKET ON LOCAL PROGRAMS

Both private and public programs have been impacted by the crash. Sedona Recycles is a nonprofit group in Arizona and one of the five largest recyclers in America. They've been forced to stop accepting certain types of cardboard because they can't find someone to take it, even for free. If they collected it, it would end up in a landfill because their storage space is packed full and they have no market to sell it.[12] Kanawha County of West Virginia (including Charleston) has ended its recycling program, and Frackville, Pennsylvania suspended its recycling program because it actually became cheaper to pay the tipping fees and dump the recyclables as garbage than to arrange for the recyclables to be taken.[13] Tom Krughoff of Quincy Recycle, Inc. points out that scrap income accounts for upwards of 40% of the budget for some sanitation departments.[14]

While some programs are cutting services or suspending programs entirely, others are maintaining their programs for environmental reasons, economic reasons, or both. Mitch Jernigan, recycling director of the Southeastern Public Service Authority of Virginia (SPSA), points out that in the past communities never thought of recycling as a for-profit scheme. The first communities with recycling programs made an investment to be consistent with their values.[15] The next major movement to initiate recycling programs came in the form of federal and state laws mandating recycling.[16] At this time the scrap market wasn't strong enough to attract much entrepreneurism.

The incredible strength of the recycling market prior to the crash attracted a host of entrepreneurs, from private companies to cities and towns deciding the costs and risks of a recycling program were no longer prohibitive. However, these recycling programs were planned with the profitability of a strong scrap market in mind and, now that the recycling market has crashed, are not meeting expectations. Jim Wilcox of the Haas School of Business at the University of California, Berkeley, explains: "Before you

[12] NY Times 12/08/2008
[13] Telegraph 12/13/2008
[14] Tom Krughoff Interview
[15] Mitch Jernigan Interview
[16] NY Times 12/08/2008

could be green by being greedy. Now you've really got to rely more on your notions of civic participation."[17]

Some communities are doing just that. Although Larimer County, Colorado, is suffering from lost income on their recyclables local officials intend to maintain the program regardless of how long the glut in the market lasts. CSU student Kevin McKenna says of bringing his recyclables to a drop-off site, "I'll keep doing this as long as they keep accepting it." Stephen Gillette, director of Larimer County Solid Waste, said that attitude is shared by many local residents and businesses that recognize recycling as a worthwhile endeavor. "People really want to do the right thing."[18]

In other cases economics still favor recycling over using landfills despite the market crash. Richard Hills, director of Middlesex County Solid Waste Management Division, is no longer able to sell the county's recyclables but has succeeded in giving them away for free. The projected expense of facing tipping fees for all of the recyclables being given away outstrips any benefits of suspending the recycling program. Hills says, "It's better to get zero than pay $60."[19] Boston city officials expect they will be forced to pay to unload their paper in the near future, but point out that it's still better than paying $80/ton in tipping fees to put it in a landfill.[20]

[17] NY Times 12/08/2008
[18] The Coloradoan 12/23/2008
[19] Edison/Metuchan Sentinel 12/23/2008
[20] NY Times 12/08/2008

THE LOCAL MARKET

Specific negotiations for sales of recyclables vary widely, but most are directly related to the market rates described above. Monroe County's program and two other local programs – Vincennes and Seymour – are examined to provide a window into the local market.

Local Recycling Market Comparison					
2008	*THE DISTRICT*	*BLOOMINGTON CURBSIDE*	*INDIANA UNIVERSITY*	*VINCENNES*	*SEYMOUR*
Est. Population Serviced	90,000	25,000	40,000	40,000	40,000
Recycling Tonnage	2,700	3,100	1,800	490	1,960
Tons/Person	0.030	0.124	0.045*	0.013	0.050
Net Recycling Income	**-$152,000**	**-$118,000**	**Incomes vary****	**$48,000**	**$231,000**
Net Income/Ton	-$56	-$38	Incomes vary**	$98	$119

**Most IU recycling is commercial which will inflate their tons/person value.*
***Different campus groups pay different amounts – many programs did not make their rates available. In general, IU is paying significantly more than the district.*

The City of Bloomington's rate is calculated for an estimated population of closer to 25,000 – those actually within range of the curbside pickup service. This creates a false comparison in rates of recycling. Firstly, none of the other entities utilize a curbside pickup program for more than a small fraction of their service area. Secondly it is important to note that Bloomington's curbside program does indeed leave a majority of the city residents without a recycling service provided by the city. Bloomington collects more than the district for two well-quantified reasons: 1) it is more urban; 2) curbside pickup is offered to a portion of the district. Seymour's incredible recycling rate (per person) is credited to an innovative and excellent outreach program.[21]

Although 2009 saw a poorer market for recyclables than previous years, Seymour still collected money for the sale of their recyclables. In 2009, the City of Seymour had a net gain of $140,000 for the collection of its recyclables; this is a steep fall from the 2008 figure of $231,000, but it was still consistently making money from the sale of its recyclables.

[21] Matt Otte Interview, Steven Boggs Interview, AISWMD Case Studies 2001

Why are the Vincennes and Seymour programs making money from the sales of their recyclables while Monroe County entities are paying about the same amount (if not more) for recycling as municipal solid waste?

The differences in the Monroe County programs are primarily due to two reasons:

1) *Monroe County programs have not been able to effectively negotiate or establish a competitive bidding process*. Vincennes has switched vendors every few years as better opportunities arise. Seymour actively seeks out the best prices and barters with companies when selling scrap. By working with four or five buyers they can consistently get one of the best prices available for selling their recyclables.[22]

   The district took a major step forward on this front when they declined all proposals requiring an "all-or-nothing" contract with them for municipal solid waste and recycling streams after they sent out an RFP over the summer. One potential difficulty also arose, in that although Monroe County is closer to both Ray's Trash and Rumpke than many of their current service areas, neither of them responded to the RFP. This is further discussed in the next section.

2) *Monroe County lacks processing capabilities for recyclables*. Both Seymour and Vincennes have MRFs with balers for their recyclables and have minimal sorting operations. There are also MRFs in many other surrounding counties including Bartholomew, Brown, and Lawrence. These facilities improve the potential income from recyclables by a tremendous amount because they can be transported more efficiently, the distance that vendors are willing to travel to purchase the recyclables increases (vastly expanding the market), and storage of recyclables is cheaper and easier. See page 28 for more details about the value of baling and MRFs.

[22] Matt Otte Interview

Local Municipal Solid Waste Transport Services

Both Calvin Davidson of Ray's Trash Service, Inc. (Clayton, Indiana) and Ben Pedigo of Rumpke Recycling expressed interest in the possibility of contracting with the district or other entities in Monroe County for both recycling and removal of municipal solid waste (MSW), should such an opportunity be available in the future.[23] Pedigo spoke with the Vice President of Rumpke to confirm interest in MSW removal and reported that Rumpke was likely to come forward with a brief statement indicating they would participate in a bidding process for services in Monroe County if such a process occurred.[24]

Rumpke has not yet produced such a document, and Ray's Trash has not yet specified under what conditions they would be interested in bidding. Because of the nature of their industry, garbage companies are not geared to pursue bidding opportunities unless invited. Matt Otte of Seymour confirmed that this is not uncommon. In order to seek out the best rates for Seymour's scrap, Otte actively seeks out vendors with the best offers.[25]

Having to attract bidders in such a process is counterintuitive; in most industries vendors aggressively pursue new contract opportunities. Due to unique market characteristics in garbage removal and recycling services many companies do not actively pursue new opportunities. One such characteristic is the absolute necessity of garbage removal: the market for garbage removal is constant, penetrates all sectors, and clients must retain service at all times. Along the same lines, it is not possible to increase the market for garbage removal. Companies tend to be territorial out of necessity – the company with the nearest facilities can almost certainly provide superior service at a lower rate, and their market size is based upon their territory as they cannot responsibly increase the demand for garbage removal. Furthermore each contract has such detailed requirements that it is difficult to make a presentation that generalizes how a company will fulfill a contract. Each contract must be figured out one by one. Companies are hesitant to make that investment unless they perceive that they will be seriously considered in the bidding process.

Although both Rumpke and Ray's Trash have indicated orally that they would definitely be interested in seeking opportunities for major contracts in Monroe County, neither responded to an RFP sent out by the district over the summer seeking contractors for hauling MSW and recycling.

Monroe County is in a position to have competitive bids for both MSW removal and recycling services because it is located within the operating range of Hoosier Disposal, Ray's Trash, and Rumpke, all three of whom have major operations in adjacent counties and some operations within Monroe County. Rumpke's landfill in Medora is actually closer to Bloomington than the landfill to which garbage is currently being sent, suggesting that – geographically – Rumpke might have an advantage in providing MSW removal services.

[23] Calvin Davidson Interview
[24] Ben Pedigo Interview
[25] Matt Otte Interview

While the benefits of a competitive bidding process are obvious, the process is unlikely to occur without the district personnel actively pursuing possible bidders by providing all prospective companies with enough information that they are capable of envisioning a specific proposal and communicating to prospective companies that the district is serious about the bidding process.

Local Recycling Vendors

All vendors listed below have an expansive enough region of service to include Monroe County.

Cardboard is the "OCC" (old corrugated containers) stream. Typically vendors will only purchase baled cardboard, papers, or plastics at long distances. Newspaper must be clean, dry, and not seared by sun. Vendors will often send their own trucks to pick up material one full trailer at a time; therefore a strategy of baling recyclables to make a wider market available does require a small amount of indoor storage space for fiber streams (newspaper, cardboard, paper).

Company	Location	Contact	Phone	Streams Accepted
Smurfit Stone Recycling Corp.	Columbus, IN Evansville, IN Wabash, IN	Wabash Office	(260)426-8000	Assorted
Ray's Trash Service, Inc	Clayton, IN Whitestown, IN Indianapolis, IN	Calvin Davidson	(800)539-2024	Assorted
Riverside Recycling	New Albany, IN	Darrell Williams	(812)948-1323	Assorted
Rumpke Recycling	Louisville, KY	Ben Pedigo	(877)888-5801	Assorted
Quincy Recycle Paper, Inc	Quincy, IL Marion, IN	Jarrod Evans	(217)224-2754	Assorted
Southeast Paper Recycling Co.	Louisville KY	Ford Chambers	(502)969-3846	Assorted
Gary Grossman Recycling	Cincinnati, OH	Gary Grossman	(513)984-5614	Assorted
Alternative Plastics	Lawrenceburg, IN	Greg Winans	(800)219-8734	#1 PETE #2 HDPE Plastics #1-#7 Post-Industrial Plastics
Clean Tech, Inc	Dundee, MI	Karl Hatopp	(313)529-2475	#2HDPE
Rex Alton Companies	Vincennes, IN	Rex Alton	(812)882-8519	Glass
Strategic Materials, Inc	Indianapolis, IN	Dean Schuehl	(317)484-2550	Glass
JB Salvage	Bloomington, IN	JB Salvage	(812)323-2886	Metals

Company	Location	Contact	Phone	Streams Accepted
Bloomington Iron and Metal	Bloomington, IN	Bloomington Iron and Metal	(812)336-6884	Metals
Newco Metal Processing	Bedford, IN	Newco Metal Processing	(812)279-8114	Metals
River Metals Recycling	Greensburg, IN	James K. Becker	(859)292-8400	Metals
AMG Resource Corp.	Gary, IN	Bruce Kutz	(610)954-0395	Metals
Cincinnati Paperboard	Cincinnati, OH	Charles Brock	(513)871-7112	Cardboard Newspaper
Georgia-Pacific	Green Bay, WS	Ted Gloeckler	(920)438-2296	Cardboard Newspaper Sorted Office Paper
Kendricks Paper Stock Co.	Mt. Vernon, IL	Debbie Hopgood	(618)242-4527	Cardboard Newspaper Sorted Office Paper
Montgomery Paper	Dayton, OH	Mitch Jacobs	(937)222-4059	Cardboard Newspaper Sorted Office Paper
NCB Commodities, Inc.	York, PA	Jerrold Breneman	(800)673-2581	Cardboard Newspaper Sorted Office Paper #1 PETE #2 HDPE
Omaha Paper Stock Co.	Cincinnati, OH	Mike Murray	(513)641-5002	Cardboard Newspaper Sorted Office Paper
Smurfit Recycling	Louisville, KY	John Gonder	(502)583-1720	Cardboard Newspaper Sorted Office Paper

Monroe County is unable to benefit from the variety of vendors available because the lack of a materials recovery facility (MRF) and baling machinery significantly reduces the distance vendors are willing to travel in order to obtain recyclables and increases the transportation cost of contracts with local vendors.

The district has previously received a proposal that would allow them to make similar recycling income to Vincennes or Seymour (~$100/ton) instead of paying about $100/ton, but that proposal required the development of some new infrastructure. This is discussed later in the section on MRFs.

Pay-As-You-Throw (PAYT) Municipal Solid Waste Systems

Pay-As-You-Throw (PAYT) systems (aka Pay-Per-Use) refer to any municipal solid waste (MSW) programs in which residents are charged for MSW services based on how much trash they produce, as opposed to traditional programs that use a flat tax or fee. The City of Bloomington presently employs a sticker-based PAYT program, while the district maintains a bag-based PAYT program. PAYT programs make MSW management more sustainable both economically and environmentally. The advantages of PAYT are often discussed in terms of the three E's: environmental sustainability, economic sustainability, and equity.

ENVIRONMENTAL SUSTAINABILITY

PAYT reduces the amount of garbage sent to landfills.[26] In an economic study of Charlottesville, Virginia, the mass of garbage was reduced by 14%.[27] Crawfordsville, Indiana experienced an immediate 39% decrease in MSW as a result of implementing a PAYT program.[28]

PAYT also significantly increases recycling rates:[29] in the Charlottesville study recycling increased by 16%[30] and one California city saw recycling rates triple literally overnight.[31]

ECONOMIC SUSTAINABILITY

The EPA's guide on PAYT programs advises that well-designed programs generate the revenue communities need to cover their solid waste costs, including the costs of such complementary programs as recycling and composting.[32] This outlook was reiterated by Steven Boggs of IDEM: "The best way to manage this is to view it as an integrated cost. It's all one puzzle; they should price their garbage costs to fund the whole program, including recycling."[33]

In Indiana the skyrocketing cost of dumping in landfills combined with the property tax freeze (property tax income can only increase by 5% per year, regardless of population growth) has cornered some jurisdictions economically. Crawfordsville's waste disposal costs more than quadrupled during the 1980s and implementing a PAYT system allowed them to balance their budget despite the freeze on property taxes.[34]

PAYT rates do have to be managed and jurisdictions must understand that garbage fees increase over time both with inflation and as landfill tipping fees trend upward. Jurisdictions that have not modified PAYT rates in 10 (or sometimes even 20) years will find that a once sustainable program is now a serious liability to a balanced budget and that they are unintentionally subsidizing the generation of garbage. The City of Vincennes recently found their streets and sanitation department budget was no longer

[26] Washington Post 04/16/2005; Skumatz and Freeman 2006; Canterbury and Hui 1999
[27] Fullerton and Kinnaman 1996
[28] EPA and AISWMD Case Studies 2001
[29] Washington Post 04/16/2005
[30] Fullerton and Kinnaman 1996
[31] Skumatz and Freeman 2006
[32] Canterbury and Hui 1999
[33] Steven Boggs Interview
[34] EPA and AISWMD Case Studies 2001

sustainable and required reevaluation. Adjusting their PAYT rate to match inflation so that the cost of a trash sticker was the same as when they implemented the program would have more than made up for the entire deficit in their budget.[35]

EQUITY

PAYT is more equitable because people who throw away less pay less. Mitch Jernigan of SPSA said "Disposing of waste costs money. People should pay when they create waste."[36] Other interviewees consistently agreed with this sentiment.

[35] Patrick O'Neill, SDG Original Research
[36] Mitch Jernigan Interview

PAYT Rate-Setting

The EPA publishes a guide to rate structure design for PAYT programs advocating two primary methods of setting rates: 1) drawing from other community models; and 2) using the six-step rate structure design process, for which there are worksheets and excel spreadsheets to assist in calculations.[37] The calculating method takes immense effort and is heavily based on projections and estimates. The AISWMD case studies of Indiana PAYT programs have found these calculations are so imprecise that rate-setting based on other community models is just as successful.[38]

The City of Bloomington currently charges $2.00 per sticker for their curbside pickup program, with each sticker covering a 32-gallon container. The district charged $1.00 per 33-gallon bag or $.50 per 15-gallon bag for the orange bags required to dispose of garbage at their drop-off sites until October of 2009. Since then they have increased the charge on large bags (33 gal) to $1.25 per bag. The following page contains comparisons to other PAYT program rates, including the value of the previous rates in Monroe County. The table is in $USD 2009.

According to IDEM, PAYT rates "need to reach about $1 per container, really $2 per container, to really motivate waste reduction."[39] The higher the PAYT rate, the more people are motivated to avoid throwing something away. This effect becomes significant at $1 per container, but truly becomes effective at $2 per container.

The district pay-as-you-throw program does not cover the cost of both garbage and recycling. The program is most accurately described as a pay-as-you-throw hybrid, indicating that charges are partially based on how much waste individuals generate and partially covered by tax dollars.

Duration	*Orange Bag Income*	*Garbage Expenses*	***Surplus/ Deficit***	*Garbage + Recycling Expenses*	***Surplus/ Deficit***
2008	$232,000	-$238,000	**-$6,000**	-$884,000	**-$652,000**
2009	$257,000	-$229,000	**$28,000**	-$860,000	**-$603,000**

The expense of the current program means that orange bag income would need to increase by a factor of 3.35, costing $4.19 per 33-gallon bag and $1.68 per 15-gallon bag. If the district had a similar net recycling income to the City of Vincennes or the City of Seymour, instead of a $215,000 loss on processing recyclables, the district would have a gain of approximately $300,000. This would reduce the total garbage and recycling expenses by $515,000.

With nearly the nearly half a million dollars in savings generated by matching the efficiency of programs like Vincennes or Seymour, the district's garbage and recycling expenses would be reduced from $860,000 to $345,000. At this rate, a full PAYT system (without tax subsidy) could be initiated at a rate of $1.68 per 33-gallon bag and $0.67 per 15-gallon bag.

[37] Canterbury and Hui 1999
[38] EPA and AISWMD Case Studies 2001
[39] Steven Boggs Interview

Economic Sustainability of PAYT Program

Orange bag sales are highly consistent, increasing by 1.2% from 2008 to 2009. It is likely that sales will remain roughly stagnant in the near future as well. Potential income from changes to garbage fees changes are assessed below.

Impact of Bag Rate Changes on Estimated Annual Income								
		NO Change to 15-gal or 33-gal bags	*Change to 15-gal bags ONLY*		*Change to 33-gal bags ONLY*	*Change to BOTH 15-gal and 33-gal bags*		
15-gal Bags		*Current Rate*	*10% Increase*	*25% Increase*	*Current Rate*	*10% Increase*	*25% Increase*	*50% Increase*
33-gal Bags		*Current Rate*	*Current Rate*	*Current Rate*	*20% Increase*	*20% Increase*	*20% Increase*	*20% Increase*
15 gallon bags	**Cost (20 bags)**	$10.00	$11.00	$12.50	$10.00	$11.00	$12.50	$15.00
	Income	$50,000	$55,000	$63,000	$50,000	$55,000	$63,000	$75,000
33 gallon bags	**Cost (10 bags)**	$12.50	$12.50	$12.50	$15.00	$15.00	$15.00	$15.00
	Income	$231,000	$231,000	$231,000	$277,000	$277,000	$277,000	$277,000
Total Sales		$281,000	$286,000	$294,000	$327,000	$332,000	$340,000	$352,000
-5% Vendor Fees		-$14.000	-$14,000	-$15,000	-$16,000	-$17,000	-$17,000	-$18,000
Annual Income		**$267,000**	**$272,000**	**$279,000**	**$311,000**	**$315,000**	**$323,000**	**$334,000**

The table above projects the value of income generated by orange bags at higher rates assuming that the same number of bags are sold. These values are actually too high for two reasons: 1) as PAYT rates increase, households reduce their waste production and recycle a greater portion of the waste they produce, and 2) at higher PAYT rates the effects of the "Seattle Stomp" are slightly higher. The "Seattle Stomp" is when people pack their garbage bags more fully to avoid having to purchase more stickers (or orange bags, in this case), gaining its name because Seattle was the first large city to implement a PAYT system. Non-PAYT collection programs have an average weight of 15lbs/32-gallon can while PAYT collection programs have an average weight of 21.5lbs/32-gallon can.[40] For small rate hikes, the overestimation from this increase is most likely 10% or less of the projected increase.

The decrease in garbage expenses from 2008 to 2009 is extremely unusual. Solid waste programs invariably become more expensive over time. Beyond the normal increases due to inflation, two major expenses associated with solid waste removal also trend towards becoming more expensive with time: gasoline for garbage trucks and landfill space.[41] Pay-Per-Use programs are not sustainable over long

[40] Fullerton and Kinnaman 1996
[41] Skumatz and Freeman 2006

periods of time without rate adjustments. The current program is likely to support the cost of garbage for the next three to five years without need for a further adjustment unless something causes a dramatic increase in the expense of garbage removal (such as the unexpected closing of a major landfill). The Pay-Per-Use program does not currently cover any part of the cost of the recycling program, which is primarily supported by county property taxes.

PAYT rates from IDEM case studies and EPA highlighted programs are shown below.[42] All of these cities have a 30-35 gallon per bag limit with the exception of Fryeburg, ME (30lb limit) and Vincennes (35lb limit). The 30lb limit for bags is effectively equivalent to a 30-gallon limit according to the EPA, although in either system bags do not typically weigh more than 25lbs.[43] The dollar amount shown is the cost of a sticker or bag at the time of the case study adjusted for inflation. All values are expressed in terms of 2008 $USD with the conversions recommended by Officer 2009 (see references for a hyperlink to his website and the conversion tools). Because cities sometimes change PAYT rates, some cities may appear in the data table twice in order to list rates from two different times. Sometimes such adjustments are just to keep in step with inflation (see Winfield, Indiana), other times these adjustments are to raise money for new services and are much greater (see Bloomington, Indiana). Notice that many programs are supported by fees beyond the PAYT fee.

District	*Approx Pop*	*$USD [2008]*	*Curbside Service*	*Other fees*
Imperial, Nebraska	2,000	$2.66	no data	no data
St. Cloud, Minnesota	49,000	$2.66	Y	no data
Woodstown, New Jersey	3,000	$2.39	no data	no data
Bloomington (2005)	70,000	$2.20	Y	NO
Oconee County, Georgia	25,000	$2.18	N	NO
Antigo, Wisconsin	8,000	$2.00	no data	no data
Lansing, Michigan	130,000	$2.00	Y	$55/household recycling tax (all households)
Stonington, Connecticut	1,000	$2.00	no data	no data
Utica, New York	69,000	$1.86	Y	no data
Aurora, Illinois	119,000	$1.80	Y	no data
Hebron, Indiana	3,500	$1.77	Y	NO
Platteville, Wisconsin	10,000	$1.65	Y	recycling program fully funded by tax dollars
Wilmington, North Carolina	62,000	$1.54	Y	$12.10/mo.; 1 can picked up free each week
Bloomington, Indiana (1993)	60,000	$1.47	Y	NO
Greencastle, Indiana	10,000	$1.37	Y	$9.50/month, 3 cans free
Winfield, Indiana (2000)	2,300	$1.37	Y	$9.50/month, 2 cans free
Trinity County, California	13,000	$1.37	Y	$100/year per household, -$1 per 40lbs recycled
Winfield, Indiana (1998)	2,300	$1.33	Y	$9.50/month, 2 cans free
Fryeburg, Maine	3,500	$1.33	no data	no data
MCSWMD, Indiana	120,000	$1.25	N	NO
Aberdeen, Maryland	13,000	$1.06	no data	no data
Tell City, Indiana	8,000	$1.01	Y	$4.00/month
Vincennes, Indiana	20,000	$0.92	Y	NO; program suffering sustainability crisis
Crawfordsville, Indiana	15,000	$0.77	Y	previous garbage fines in place, 1 bag/wk free

[42] Indiana data from: EPA and AISWMD Case Studies 2001; Out-of-state data from Canterbury and Hui 1999
[43] Canterbury and Hui 1999

Environmental Value of Recycling

ENERGY: One of the primary values of recycling is the reduced energy required to manufacture goods from recycled materials as opposed to from virgin materials. Each ton of recycled material saves 14.3 million BTUs of energy.[44] This is roughly equal to all the electricity that 5 households consume in one month.[45]

GREENHOUSE GASES: Also due to manufacturing offset, recycling causes a significant reduction in CO_2 emissions. Producing newsprint, cardboard, glass containers, aluminum sheets, and plastic pellets with virgin materials creates 3,289kg of CO_2 equivalents, while using recycled materials only require that 842kg of CO_2 equivalents be released into the atmosphere. Recycling cuts down CO_2 emissions from manufacturing by just over three quarters, with a net savings of 2,447 kg CO_2/ton.[46]

HUMAN HEALTH: Public health consequences can be quantified by using a conceptual unit called the DALY (disability-adjusted lifetime year). DALYs "account for years of life lost and years lived with a disability, adjusted for the severity of the associated unfavorable health conditions."[47] Certain air pollutants have known, quantifiable impacts on a population's rates of disability and disease. Researchers estimate that for every 5,000 tons of recycling that occur, one year of disability is prevented and one person lives a year longer.[48]

HUMAN AND ECOLOGICAL TOXICITY: Human toxicity is measured in pounds of toluene equivalents as toluene is toxic to humans, and ecological toxicity is measured in (2,4-D) equivalents as (2,4-D) is devastating to ecosystems. Every ton of recycling prevents the equivalent of nearly 800lbs of toluene in human environmental toxicity and also prevents just over half a pound of (2,4-D) equivalents. Recycling also helps minimize environmental problems like acidification and eutrophication.

LANDFILL REDIRECTION: Landfills are not only proven to slow the degradation of solid waste, they're also becoming a scarce resource as many close. No one wants a landfill next door – both as a quality of life issue and for the sake of their land value. A landfill in Staten Island that receives 22,000 tons of garbage per day will soon be the 2nd highest point on the Eastern Seaboard south of Maine.[49]

PLASTIC REDIRECTION: The redirection of plastic from landfills is also key as plastics are non-biodegradable and will never degrade in a landfill. Every piece of plastic we manufacture will stay on this earth forever. We are already witnessing the effects of our disposal of plastic: the plastic gyre – a swirling mass of plastic waste more than twice the size of Texas in the southeast Pacific Ocean – now threatens the entire ecosystem of that region as plankton feeders (or filter feeders) are consuming plastics and dying of plastic poisoning.[50]

[44] JLCA
[45] US Energy Information Administration
[46] JLCA
[47] Lippiatt 2002
[48] JLCA
[49] Gore 2002
[50] PLoS ONE Article

Recycling Infrastructure Strategies

STRATEGIES MUST BE LONG TERM

Even an annual view is shortsighted in recycling and municipal solid waste management. Ideas about budgeting must include an understanding of the future of the district and long term market behavior.

Recycling infrastructure strategies must be long term; a program cannot succeed if investments in infrastructure cease during market lows. Commodity markets – and recyclable markets even more so – are prone to a high level of fluctuation. Just as market lows should not trigger the disassembly of recycling infrastructure, market highs should be understood to be temporary and budgets cannot be made with the expectation of a consistent strong commodities market.

Tom Krughoff of Quincy Recycle, Inc. explained in January 2009 that the company believed the market had bottomed out and should start recovering sometime soon. He pointed out that scrap prices did not fall from December 2008 to January 2009. "We're starting to feel like we're at the bottom. It's the first time in 6 months there's been no change in the market."[51] Krughoff was correct – a rapid recovery ensued almost immediately.

At the beginning of the recession, Waylon Lynch of TFC Recycling in Chesapeake, VA anticipated the market will remain flat through early 2009, and then prices would start to recover. "I've been here for six years and the prices are like a yo-yo. You've got to be in it for the long term."[52]

Karen Haley, director of the Indianapolis Department of Public Works' Office of Sustainability, said that rapid fluctuations and periodic recessions are common in the scrap market and isn't concerned that the market won't recover.[53] Like Krughoff, both Lynch and Haley accurately understood the nature of the scrap market and their predictions were rewarded.

Some veterans of the field were so confident that the recyclables market would recover that they invested in storage space to house their scrap until it could yield a better price. Johnny Gold, Senior VP at the Newark Group said "We're warehousing it and warehousing it and warehousing it." They anticipated that the market would upswing within six months.[54] They were correct and their warehousing venture was likely a profitable one.

Other companies that warehoused their scrap include Sonoco[55] and Midland Davis Corp.,[56] two of the largest recyclers in America. Both companies made plans to warehouse perishable scrap (i.e. paper) and pile up plastics and metals until the spring, at which time they think the markets will be likely to have recovered significantly. By the first quarter of 2010, the markets have certainly recovered significantly –

[51] Tom Krughoff Interview
[52] News&Observer 12/26/2008
[53] Indianapolis Business Journal 1/19/2009
[54] NY Times 12/08/2008
[55] News&Observer 12/26/2008
[56] NY Times 12/08/2008

some commodity streams are at the highest they've ever been with the exception of the 2008 bubble before the severe crash at the end of 2008.

Monroe County Solid Waste District Director Larry Barker pointed out that many entrepreneurs added recycling as a service during the past few years while the market was good, and that these same businesses are closing doors as fast as they opened. Similarly, many small town programs are ending. As the scrap market primarily responds to simple supply and demand economics, he anticipates this loss of supply will soon contribute to driving up the price of scrap.[57]

FUTURE DIRECTIONS

A strong recycling program with high participation is not only environmentally responsible, but also economically sustainable if it is maintained long term. Ideally, funding will remain sufficient to allow for the maintenance of recycling infrastructure and services during downturns in the scrap market, and extra funding can be used to expand recycling programs when the scrap market allows for a profit. The best systems – both environmentally and economically – are automated single-stream systems. These systems are expensive and presently cost-prohibitive for jurisdictions that cannot compile a large enough volume of recyclable materials to justify the investment. In these systems mechanical truck arms lift and empty a standardized 95-gallon container provided to every household on the pickup route. The materials are then sorted automatically by machine. This process increases contamination from around 5% to around 16%[58] but increases the amount and type of recyclables received by such a large margin that the increased contamination of this process is not a significant factor.

Unfortunately, such systems require tremendous infrastructure including multi-million dollar sorting machines and expensive trucks for the automated pickup. Direct installation of such an infrastructure in southern Indiana may not be feasible. Without the capacity to invest in fiber optic sorters (a multimillion dollar investment) it is not practical to create a single stream system due to contamination caused by glass. Regionalization will be necessary to access these options in the near future. Maintaining an open dialogue about recycling issues with neighboring solid waste management districts and local governments will be critical to helping programs survive future scrap market busts and may provide opportunities to improve in efficiency, participation, and income. Monroe County has an important role to play in regionalization efforts as it is the natural hub in the local area for such a project.

Other future steps can also be seen in examples from other cities: San Francisco has made it illegal to throw away food or yard waste in the garbage and provided all residents with a separate compost bin. Several yard waste composting facilities have begun to accept food. This is not without any cost, since it requires investment in systems to screen out plastic detritus like sandwich bags, or sporks and cope with odors. In the end the systems are profitable as microorganisms and worms convert the compost into fertilizer worth $15/4 gallons. Furthermore, nearly 20% of carbon emissions in the U.S. are from landfill gases, and composting avoids the release of greenhouse gases.[59] This is just one example of a cost sustainable investment to improve municipal solid waste management's carbon footprint. [Note: such

[57] Larry Barker Interview
[58] Mitch Jernigan Interview
[59] Sierra March/April 2010

an effort would have to be regional for Monroe County to obtain the volume necessary to mimic this exact program in a cost effective way.]

There are many such developments to consider in continuing to improve the district's infrastructure. The goal is to have a program that maximizes recycling participation and minimizes the carbon footprint of the actual recycling process. If we wish for the possibility of a single-stream, automatically sorted, regionalized (includes neighboring counties, local entities, etc.) and cost-effective recycling program in the future of the district, we must begin taking small steps today to improve the infrastructure.

This future direction is not borne entirely from an environmentalist perspective. Pragmatically, communities may face difficult consequences if they don't start preparing their recycling infrastructure for the expectations of future solid waste management. Many states have begun implementing laws that require entities to demonstrate a certain level of waste redirection or pay penalties to the state. Specific recycling systems are mandated in many states and proposed in others. It is not unlikely that federal legislation could eventually be enacted as sustainability becomes an ever more pressing issue for our solid waste programs on a daily basis.

Landfill space is always at an increasing premium and has become much more costly over time. The solid waste community refers to the 1980s as the 400% increase decade because tipping fees quadrupled nationally (after accounting for inflation).[60] Additional increases have been seen since then (in the Midwest from 1993-1996 by 27%,[61] from 1998-2001 by 10%[62]). The past few years have shown further increases and only more increases can be expected. Ultimately, landfill space is not a renewable resource and prices will increase. Signs that steep increases may be just around the corner are starting to appear as certain areas such as Iowa and Alberta province in Canada have just experienced sharp rate hikes.[63]

[60] Repa 2001
[61] Cole 1996
[62] Repa 2005
[63] Pella Chronicle 2009

MRF Proposal and Recommendations

THE VALUE OF AN MRF AND BALING EQUIPMENT

A specific proposal discussing the creation of an MRF was made by the district's Director Larry Barker to the Board of Directors in August 2009. This proposal cited the financial success of the previous MRFs located on South Rogers and the Monroe County Landfill. The lack of an MRF facility is one reason Monroe County programs are not as cost-efficient as neighboring programs.

The following are ***financial benefits*** of baling and an MRF:

1) Transportation becomes far less expensive.

2) The geographic limit for the marketing of recycled goods is widely expanded. There are companies from as far away as North Carolina and Wisconsin with some active contracts in Indiana.

3) The higher storage capacity at an MRF and the compact nature of baled materials allows companies to await the accumulation of an entire truck haul before coming to make a pickup, increasing the rates they are able to pay and opening the potential market for goods to smaller companies.

4) The operation of the MRF is likely to create 3-7 jobs in Monroe County.

A significant ***environmental benefit*** also occurs: baling recyclables significantly reduces the carbon footprint of a recycling program. What was previously ten truckloads (or more, pending the commodity) to a distant site becomes one.

COSTS AND RISKS ASSOCIATED WITH BALERS AND AN MRF

Two major concerns regarding new recycling infrastructure are cost and reliability. A previous proposal quoted the exact cost of balers: $110,000 + $5,000 to purchase them outright, or $1,800/month to lease them ($600 per unit). Additionally, at least two workers would need to be hired to operate the balers.

Some companies are able to mitigate reliability as a concern in the following ways: 1) companies like Quincy Recycle have already tried and tested their equipment and contracts with many programs (including Vincennes) with successful results; and 2) proposals may provide training and support for the machinery they sell or lease. This support is invaluable.

One risk included in Executive Director Barker's MRF proposal is that "The City of Bloomington has expressed some concern regarding their relationship with Hoosier Disposal and Recycling if the District decides to own and operate an MRF."[64]

[64] Barker's Proposal

This is unlikely; Solid Waste Management District directors' themselves have direct input on the regulation of gate fees; Hoosier Disposal does not possess a monopoly for the region and can be replaced; and lastly Hoosier Disposal's contracts with Bloomington are long term and won't be adjusted for 5 years.[65] Furthermore, Hoosier Disposal is unlikely to engage in action that could be perceived at retaliatory negotiating.

KEY PRINCIPLES IN DESIGNING AN MRF

For basic technical information discussing considerations such as types of balers and operational details, please see Appendix A.

REDUNDANCY: An MRF must have the capacity to continue operation and keep up at least a partial pace with incoming recycling even in the event of machinery failure.

EXPANSION: A well designed MRF has the capacity to meet not only present needs but the anticipatable needs of the future. It should not run at capacity in its initial years, as the demand on the MRF will increase over time. Additionally, the ability to make a major expansion should be available should a major change occur in the demand for the MRF, whether that be from new regionalization contracts, rapid growth in the population served, or increases in recycling participation.

STORAGE: An MRF should be designed to store – at absolute minimum – two weeks' worth of its own production rate. Alternate strategies to handling MRF production are also possible, including the use of multiple balers or an on-demand hauling contract.

RELIABILITY: Risk is minimal, especially in contracts that remove the risk associated with major capital purchases of heavy machinery, as they include that it is the vendor's responsibility to maintain and provide technical support for the balers they provide.

VOLUME AND COLLABORATIVE OPPORTUNITIES

Executive Director Barker's proposal was for a baler with a minimum annual capacity of 2,700 tons of recyclables – going up to 5,400 tons if double shifts are used five days a week, allowing the district to account for its own growth in the near future and providing the opportunity to collaborate with other entities.

Members of the Indiana University community have expressed enthusiasm about the possibility that the distict would construct an MRF. With Gary Chrzatowski's help SDG researchers were able to determine that the Indiana Memorial Union (IMU) produces between 100 and 200 tons of recycling per year. Chrzatowski says they are willing to sort their recyclables as this was their standard policy until recently, and their recyclables are usually very clean. The IMU would be excited to work with a local MRF for both economic and environmental reasons. Other Indiana University groups have also recognized the value that a local MRF could provide and are anxious to see the district move forward with this opportunity. Although IU does not track any waste management data, Steve Akers assisted SDG researchers in determining that IU recycles approximately 2,000 tons per year. This number is lower

[65] Susie Johnson Interview

than similar campuses and recognition of this low rate has instigated efforts to increase recycling through programs like *Recyclemania*. It is conceivable that IU could create a large-scale collaboration with the district. This would be a positive development as recycling value is largely dependent on producing a high volume of goods (as both Mitch Jernigan of SPSA in Virginia and Matt Otte of Seymour heavily emphasized when interviewed), however it would pose the challenge of nearing the proposed MRF's maximum capacity very quickly. This would be without even considering any opportunity for cooperation with the City of Bloomington or entities from surrounding counties.

For this reason the second principle of strong MRF design must be considered: expandability. While it is unreasonable to build a massive MRF on speculation that a drastic increase in recycling intake might occur, it is important to design and create a facility with expansion in mind. If the county's solid waste program is to be viewed as a path to sustainability and not a series of stopgap measures, that program must be designed to allow for future growth.

Recommendations

1) The immediate state of the market values for recyclables is prone to rapid changes, therefore market fluctuations in scrap value – whether high or low – should not be considered when making long term infrastructure plans.

2) Considerable effort should be taken to cultivate relationships with representatives from the waste management industry so that they understand the needs of Monroe County and how they might integrate their services in order to revive competition in the bidding process for the district's hauling contracts.

3) The district should increase recycling processing capabilities as funds allow. Previous proposals have been consistent with Executive Director Barker's proposal for a new MRF that would result in a major improvement for the district's finances and total waste redirection. It would be beneficial to communicate with multiple recycling contractors before accepting any deal.

4) Any new facilities would need to be built with the capacity for future expansions, to reflect the long term plan of proceeding towards sustainability in addition to considering immediate needs.

5) Volume makes a program more financially efficient. Collaboration – especially with local entities such as Indiana University and the City of Bloomington – could allow the district to pursue even more advantageous recycling contracts and create partners for future infrastructure improvements.

6) Outreach works. Seymour's outstanding per capita recycling is typically credited to their outreach programs. Similar programming in Zionsville, IN results in an unusually high amount of recycling. It is important to prioritize and sustain outreach efforts to keep the community informed of what they can recycle and how. Studies continually show that people are confused and uncertain about recycling programs – even in communities with simple, streamlined programs.

7) All contracts for recycling should include clauses requiring a guarantee that materials do not end up in landfills. Local companies are amenable to including such clauses and this is the only way to ensure recycling does occur.

8) Glass should remain a separate stream in recycling. Although combining streams is generally desirable environmentally and increases the redirection of waste by increasing the ease of participating in recycling, the loss in commodity value and risk of injury to processing personnel when combining glass with other streams is high. Unless the district is able to obtain automated sorting equipment with the capacity to effectively manage glass, it is most efficient for glass to remain a separate stream.

9) While there are costs associated with the decision to construct a MRF for the district, there are many long term financial and environmental advantages to this approach to processing recyclables. The district should consider incorporating the construction of a MRF in its long term strategic plan.

Directions for Further Study

ACCESSIBILITY AND PARTICIPATION

The City of Bloomington's curbside service does not serve businesses and high-density residential areas (buildings with 4 or more separate units). Very few businesses or apartment complexes offer recycling through a private contractor. The District's Green Business Network has successfully incorporated some businesses into our county's recycling infrastructure, but there are still many gaps.

The specific locations and extent of those gaps are not within the scope of this report, but represent a further opportunity to redirect waste from landfills and improve the district's recycling program.

APPENDIX A: WASTECARE FACTS ABOUT BALERS & RECYCLING

Excerpt from WasteCare Corporation (with permission):

http://www.wastecare.com/Products-Services/Balers/aboutbalers.htm

C) **TYPICAL BALER SIZES and TYPES OF BALERS**. Typically, Balers are referred to by the bale size that they produce. For example, 30" Balers produce a 30" Bale (in width), which is generally about the smallest size Baler available. (Of course, the height and depth are the other two dimensions required in order to determine the actual bale size in cubic yards or cubic feet.) A 30" Baler would most likely produce a Bale Size that was close to .50 cubic Yards or 13.5 cubic feet. (For example, a Bale Size of 30" H X 30" W X 24" D = 21,600 cubic inches which is roughly one-half of a cubic yard.) Typical vertical Balers can range up to Bale sizes of 80" (in width) or even higher. Therefore, if some basic dimensions are utilized on a Baler this size (such as 40" H X 80" W X 40" D) the Bale size could be as much as 2.7 cubic yards or higher. By multiplying the three dimensions together, it is easy to calculate the actual Bale Size. As part of the bale size consideration it is important to try to size the baler so that employees or users do not have to do too much preparation of the materials before putting the material into the baler (such as bending cardboard). Therefore, before deciding on a Baler Size, it is important to evaluate the typical size of the items in the overall waste stream to be baled, in conjunction with the Loading Door Opening of the Baler and the space that is available. Extra space has to be allocated for not only removing the bales from the Baler but also any service requirements that might be necessary (usually about a foot or so from the wall on the back and sides of the Baler). Also the ceiling height is very important since the cylinder movement requires extra height beyond the normal 'resting height' of the unit. Some of the other typical baler sizes are 42" Balers, 48" Balers, 60" Balers, 72" Balers and 84" Balers. There are also Specialty Balers such as Bottle Can Balers and Foam Balers, Film Balers, Fiber Balers, as well as Core Tube Balers and Scrap Metal Balers. There are also Vertical Balers and Horizontal Balers. In short, whether it is corrugated cardboard recycling, paper recycling, plastics recycling, metals recycling, or other types of waste recycling, there is a baler or other recycling equipment for almost any application within reason.

D) **BALE WEIGHTS** – Depending upon the type of material being baled and of course the size and mechanical configuration of the Baler itself (i.e. motor, cylinder, pump, etc) the bale weights can vary greatly. Typical Bale weights for respective materials, such as cardboard (OCC), HPDE, PET, Steel Cans and so forth are usually readily available. Oftentimes the cardboard bale weight is used as a benchmark measure since it is one of the most common items baled. In addition to bale size the bale weight is also an important consideration for determining the desired Baler. The seriousness and 'depth' of the Recycling Program usually helps determine the level of care that needs to be taken in deciding on bale weights and sizes etc. Oftentimes bale weights and sizes are just a matter of preference based on handling routines and general logistics.

E) **SOME TYPICAL LOOSE & BALED WEIGHTS OF VARIOUS MATERIALS (per cy or cubic yard)**

Type of Material	*Loose*	*Baled*
Corrugated Cardboard	50 – 100 lbs/cy	700 - 1100 lbs/cy
PET (Soda bottles, food packaging etc)	30 – 40 lbs / cy	400 - 600 lbs/cy
HDPE (Milk Jugs, Detergent Containers etc)	22 – 25 lbs / cy	400 – 500 lbs / cy
Aluminum Cans	50 – 75 lbs / cy	250 – 500 lbs / cy
Steel Cans	150 – 175 lbs / cy	700 – 1,000 lbs / cy
Paper	250 – 500 lbs / cy	1,000 – 1,200 lbs / cy
Newspaper	350 – 500 lbs / cy	750 – 1,000 lbs / cy
Glass	500 – 700 lbs / cy	1,500 – 2,500 lbs / cy
Textiles	125 - 175 lbs / cy	600 – 750 lbs / cy

F) **BASIC BALER CONSIDERATIONS**. By evaluating a few factors such as space available, material(s) to be baled, depth of the recycling program and the preferred bale weights and/or the bale sizes, the Baler type and size that is most suitable can be defined more easily. Knowing the volume of material that needs to be baled each week or month is a good starting point. For example, if a facility was generating 2,000 pounds of cardboard each week, they could get 2 bales per week by utilizing a Baler that produced bale weights of roughly 1,000 to 1,100 pounds, or they could get 5 or 6 bales per week if they utilized a Baler that produced bale weights of around 350 – 400 pounds. And of course, in each case the bale size (in cubic yards or cubic feet) could easily be determined by referring to the 3 'bale size' dimensions (H X W X D). Therefore, in this example, using these two alternatives it would be a matter of deciding how many bales per week would be preferred as well as the bale size being produced. The more serious the recycling program and objectives, the more it will require detailed evaluations of bale sizes and weights and how they are to be transported in order to maximize payloads. Maximizing payloads involves determining the best way to maximize the bale tonnage per load, depending upon the mode of transportation such as flat bed trailer, closed van trailer or shipping container.

G) **SORTING MATERIALS PRIOR TO BALING**. The depth of the recycling program will also determine other considerations such as the level of presorting requirements. To achieve maximum value from Balers as it relates to a recycling program, there should be adequate allocations made for proper sorting.

3. **BASIC BALER BENEFITS**

By using some basic information it can be a simple process for determining the benefits that will be derived from a Baler. Balers that are purchased with a specific purpose in mind and are utilized properly almost always yield great paybacks. Waste from business operations is a highly

neglected area and because of that there are tremendous streamlining and efficiency benefits (aside from recycling benefits) that can be derived by baling and compacting waste. Reducing loose waste to cubes of trash (whether compacted or baled) offers management much insight that is otherwise unknown and impossible to quantify. Taking control of waste processing routines can also help to pinpoint problems in other areas such as purchasing practices that might be causing unnecessary waste.

A side benefit of balers (just as with compactors) is that they can provide the owner / operator with fairly accurate trash weight information. By knowing the average weight of each bale, then it is just a matter of tracking the number of baled cubes in order to derive the total estimated weight of material for a given period of time, whether weekly or monthly. With loose trash, especially when it is being discarded in dumpsters through different channels it is nearly impossible.

4. **BASIC CONSIDERATIONS OF VARIOUS STYLES OF BALERS.**

As mentioned above, there are many different styles of Balers that are available to fit almost every (reasonable) need. This includes Low Profile Balers (that are designed to operate with less ceiling height than normal), Conveyor System Balers (for very high volume applications), High Density Balers (for baling the really tough materials), Specialty Balers (such as those designed to bale specific items such as soft drink cans and bottles), and many others. Standard Balers are oftentimes the best choice due to overall versatility and most common application of the features provided.

Excerpt from WEBSITE:

http://www.wastecare.com/Products-Services/Balers/aboutbalers.htm

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Monroe County Solid Waste Management District
Strategic Planning Report

April 2010

Prepared by
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planning & research solutions



Monroe County Solid Waste Management District

Materials Recovery Facility Cost Assessment

June 2010


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Executive Summary and Key Findings

Over the past five weeks, Strategic Development Group (SDG) and Garmong Construction have conducted an assessment to provide estimates for the establishment of a Materials Recovery Facility (MRF) for the Monroe County Solid Waste Management District. This assessment was to include "estimates for retro-fitting the identified Otis site to accommodate a Materials Recovery Facility (MRF) operation, for the purchase and installation of the necessary equipment, and for the projected revenues and operating expenses." Additionally, the assessment was to "provide a comparison of these estimates with the costs and revenues under the District's present recycling program." Although our projections are based on documented, historical information and professional research, neither SDG nor Garmong can provide a guarantee for these estimates since fluctuations in market conditions cannot always be anticipated.

Garmong Construction provided the analysis and preliminary cost estimates for retrofitting the Otis site.

SDG conducted the following research activities:

- 20 hours of web-based research on MRF costs, revenues, and best practices
- Interviews with 10 MRFs operating in the region
- Site visits to 2 MRFs operating successful programs in the region
- Interviews with 3 manufacturers of balers and 3 manufacturers of sorters

We have determined that:

- The Otis site, with the retrofit, has both sufficient space and sufficient internal and external infrastructure to operate as a MRF – including the capacity to store unprocessed materials for up to month and to accommodate two or more balers with appropriate sorting lines and equipment.
- Sorting equipment does produce efficiencies over hand sorting; based on interviews with MRF operators and vendors, the equipment also provides a more refined and less contaminated product. The equipment must be viewed as a longer term investment. As an example, the capital expense of non ferrous separation and heavy light separation could be eliminated in the first year by hiring two additional sorters, increasing labor expenses by about $60,000/yr, but lowering the initial capital expense by as much as $180,000. However, these machines are durable and would cover their capital cost in 3 years.
- The floor requires sandblasting and a sealer because the original seal is no longer viable and the concrete is porous; spills, including potentially toxic substances, will soak into the concrete and remain embedded without a sealer.

- Office equipment including a desk, phone, and computer with appropriate software will be moved from the Green Business Network into the MRF obviating the need for purchase of additional equipment; it will require a protective cover from dust.

- Building and maintaining a cash reserve from recycling income as in Martin County is advisable; we found no standard practice on the amount, which would need to be aligned with individual circumstances and evolving market conditions at each MRF. Over a ten year period, Martin County built and now maintains a cash reserve of $300,000 to $600,000, representing approximately 50% to a full year's operating expense.

We have arrived at a projected capital cost of $774,500 (assuming equipment is purchased and not leased) taking into account:

- Retrofitting the Otis building site, which consists of 66,000 sq ft of industrial space, for operation as a MRF

- Purchasing appropriate balers and sorters and maintaining them

- Purchasing a roll-off truck or outsourcing (included in present operational costs)

We have arrived at a projected annual processing cost for operating the MRF (assuming equipment is purchased and not leased) of $330,000 taking into account:

- Staff to operate the MRF
- A certified driver to operate the truck if purchased
- Property Lease
- Maintenance
- Insurance
- Electrical power
- Water and sewage
- Heat
- Fuel
- A factor for miscellaneous Services
- Residual disposal

We have projected the following cost scenario for leasing equipment as opposed to purchasing it:

- Taking a 5 year lease on the balers would reduce the capital expenses by $166,600 (from $574,500 to $407,900), and processing costs would have a net increase of $39,292.32 annually for the first 5 years and a 5 year total cost of $196,461.60.

- If a 5 year lease were taken on the balers and all additional equipment costs (roll-off truck, ferrous separator, conveyors) the capital expenses would be reduced by $306,600 (from $574,500 to $268,500) and processing expenses would have a net increase of $72,296.28 annually for the first 5 years and a 5 year total cost of $361,480.14.
- Under the baler lease option:
    - Projected capital cost is $407,900
    - Projected annual processing cost for operating the MRF is $369,292.32
- Under the lease for balers and all additional equipment:
    - Projected capital cost is $268,500
    - Projected annual processing cost for operating the MRF is $402,296.28

We have projected the following revenues or reduced expenses for the district and the city as result of the MRF:

- Annual revenue from district materials during stable market conditions of $263,000 to $366,000 with a mid-value of $315,000
- Annual revenue from district materials during downturns of 146,000 to 219,000 with a mid-value of $183,000
- Annual savings to the district of $200,000 as a result of discontinuing current contracts for recycling
- Annual revenue from city materials during stable market conditions for the city of $288,000 to $390,000 with a mid-value of $340,000
- Annual revenue from city materials during downturns of $156,000 to $234,000 with a mid-value of $195,000
- Annual savings to the city of $118,000 as a result of discontinuing current contracts for recycling

It is important to note that the City of Bloomington and the district will need to negotiate how to internally handle fees for processing city materials which will require additional sorting and for profit sharing when applicable.

Equipment Purchased – Stable Market Conditions Annual Net				
	Revenue from Materials	Annual Savings	Processing Cost	Net
District	$315,000	$200,000		
City	$340,000	$118,000		
District & City Total	$655,000.00	$318,000.00	($330,000)	$643,000
Initial capital cost of $774,500 recovered near the beginning of year 2. In spite of slightly higher capital investment, net remains higher than in the lease option in subsequent years.				

All Equipment Leased – Stable Market Conditions Annual Net				
	Revenue from Materials	Annual Savings	Processing Cost	Net
District	$315,000	$200,000		
City	$340,000	$118,000		
District & City Total	$655,000.00	$318,000.00	($402,296.28)	$570,702.78
Initial capital cost of $268,500 recovered in less than a year. The quick recovery of the capital cost is at the expense of a reduced annual net in comparison to the purchase option in subsequent years.				

Equipment Purchased – Market Downturn Annual Net				
	Revenue from Materials	Annual Savings	Processing Cost	Net
District	$183,000.00	$200,000.00		
City	$195,000.00	$118,000.00		
District & City Total	$378,000.00	$318,000.00	($330,000.00)	$366,000.00
Initial capital cost of $774,500 recovered near the beginning of year 3. In spite of slightly higher capital investment, net remains higher than in the lease option in subsequent years.				

All Equipment Leased – Market Downturn Annual Net				
	Revenue from Materials	Annual Savings	Processing Cost	Net
District	$183,000.00	$200,000.00		
City	$195,000.00	$118,000.00		
District & City Total	$378,000.00	$318,000.00	($402,296.28)	$293,703.72
Initial capital cost of $268,500 recovered in less than a year. The quick recovery of the capital cost is at the expense of a reduced annual net in comparison to the purchase option in subsequent years.				

Summary of Interviewed MRFs

BARTHOLOMEW COUNTY SOLID WASTE MANAGEMENT DISTRICT

Key Facts and Figures:

- Population of Service Area = 71,000
- 2009 Total Recycling Tonnage = 1,873 Tons + 1,138 Tons via Abitibi + 430 Tons via Rumpke
- 2008 Total Recycling Tonnage = 2,274 Tons + 1,424 Tons via Abitibi + 367 Tons via Rumpke
- 2007 Total Recycling Tonnage = 2,463 Tons + 1,262 Tons via Abitibi + 268 Tons via Rumpke
- 2009 Recycling Revenue = $95,000
- 2008 Recycling Revenue = $210,000
- 2007 Recycling Revenue = $240,000

Operations Summary:

Bartholomew County Solid Waste Management District primarily collects recyclables through four venues: satellite recycling drop off locations, collection at the main recycling center, a curbside pickup program for commercial patrons, and Rumpke's roll-off program (which accepts comingled recyclables).

Shirley Burton, Recycling Manager, advises that "Whatever you do keep your recyclables clean." A first impression will form a bad reputation in the minds of buyers, while consistently clean materials will cause buyers to make much more generous offers.

All materials are collected and presorted with the exception of Rumpke's program. Bartholomew Co. SWMD then bales most streams and sells different streams to different buyers.

- Green glass, brown glass, and clear glass are sold to Strategic Materials in Indianapolis.
- Newspaper is sold to Allweather (insulation manufacturer).

- Plastic is sold to the highest bidder: most often Quincy Recycle but sometimes Indianapolis Recycling.
- Junk mail, books, and office paper are sold to Rock Tenn.
- Aluminum is sold to the highest bidder each time a truckload is collected.
- Batteries are sold to Interstate Batteries.

POSEY COUNTY SOLID WASTE MANAGEMENT DISTRICT

Key Facts and Figures:

- Population of Service Area: 27,000
- Annual Recycling Tonnage = ~1,250 Tons

Operations Summary:

Posey Co. SWMD has curbside pickup for some areas and several drop-off locations. They collect clothes, shrinkwrap, plastics #1, #2, #4, and #5, toys, shop metals, and glass. All materials are fully presorted when collected, with the exception of plastics collected from curbside which are comingled. The Director and Office Manager are able to hand-sort this comingle themselves because it has a limited volume.

Posey Co. SWMD utilizes two small vertical balers and one horizontal baler. One of the small balers is dedicated to plastic grocery bags because they can be difficult to store without putting them into the baler: it takes 70-80 boxes of plastic grocery bags to make a single bale.

They recommend collecting shrinkwrap since it is one of their most profitable commodities. They receive large quantities from grocery stores and the industrial sector. They also strongly advise obtaining more than the minimum amount of space anticipated for use, saying that “Any space you have, you’ll fill if you’ve a mind to.”

SPENCER COUNTY SOLID WASTE MANAGEMENT DISTRICT

Key Facts and Figures:

- Population of Service Area: 20,000
- 2009 Total Recycling Tonnage = 1,070 Tons
- 2009 Recycling Revenue = $69,000

Operations Summary:

Spencer Co. SWMD has eight manned drop-off sites and one driver who hauls material to the recycling facility. They use one horizontal baler to bale those materials. Streams are collected presorted into office paper, magazines, cardboard, plastic bags, #1 plastic, #2 plastic, and mixed glass. Newspaper, aluminum, and steel are also collected, but not baled. Glass isn’t sorted; DNL Enterprises buys the glass

and uses it in road construction. DNL crushes the glass themselves. As of the December 2008 crash of the recycling market, they were forced to stockpile glass for a brief period, but DNL later purchased the stockpile.

Alice Middleton, who is comptroller and primarily responsible for household hazardous waste, praised Monroe Co. SWMD and Scott Morgan for their household hazardous waste training. Given that training, she has learned to manage acids, bases, poisons, toxins (including paints), mercury, and other heavy metals. These skills have proved invaluable since Spencer Co. SWMD is the organization that must respond to hazardous waste issues in the county and has only 4 full-time employees (director, comptroller, driver, and foreman). When contacted about waste at an old farm that turned out to be Agent Orange, Middleton was prepared to properly respond.

CITY OF VINCENNES / KNOX COUNTY SOLID WASTE MANAGEMENT DISTRICT

Key Facts and Figures:

- Population of Service Area: 39,000
- 2008 Total Collection Tonnage = 490 Tons
- 2008 Total Recycling Revenue = $48,000

Operations Summary:

Vincennes currently offers free recycling pickup for persons living within the city, while Knox Co. SWMD provides rural drop-off locations that collect recyclables which are then transported to Vincennes for processing. Vincennes collects materials presorted and uses two horizontal balers and one vertical baler. They do not accept glass, citing its low market values and safety concerns.

Recycling is offered for free as a result of a $0.60 fee paid by residents for each bag of garbage and additional funding from the City which covers the cost of both garbage and recycling. For comparison, Bloomington's system charges $2.00/bag and provides a greater amount of tax-support for their garbage collection. Martin Co. has virtually no tax support for garbage removal and charges $2/small bag (~$4/bag equivalent to Vincennes or Bloomington) for people who bring a load of recycling to the garbage drop-off along with their garbage. For those that do not bring recycling the price is $5/bag (or about ~$10/bag equivalent to Vincennes or Bloomington).

According to an article in the Vincennes Sun Commercial News, the City of Vincennes was compelled to respond to a 2.2 million dollar budget shortfall in March of this year.[1] In an effort to reduce expenses, they are curtailing public services which include solid waste. According Lori Buehlman, assistant to the Mayor, the city is presently maintaining its curbside pickup program for a limited number of households but is closing its drop off station. Republic is now providing a single comingled drop off station. Ms. Buehlman stated that there is no charge for the drop off station at the present time.

[1] *Vincennes Sun Commercial News*, March 25, 2010.

The Director of Knox Co. SWMD, Tracy Clinkenbeard, also pointed out that Monroe Co. SWMD has been extremely useful in providing household hazardous waste information.

BROWN COUNTY SOLID WASTE MANAGEMENT DISTRICT

Key Fact and Figures:

- Population of Service Area: 15,000

Operations Summary:

Despite the small size of the county, Brown Co. SWMD operates a staffed drive-through recycling center in Nashville. In addition to the drive-through center there are also two satellite drop-off locations. They collect presorted recyclables including separated glass, newspaper , plastic, cardboard, and aluminum/steel cans. The center is staffed by one full-time sorter and seven part time sorters, who assist patrons, sort out #1 and #2 plastics, and separate steel, scrap aluminum, and aluminum cans into separate streams (since cans are a higher quality of aluminum).

Their equipment consists of two balers: one vertical and one horizontal, as well as a can sorter that separates steel from aluminum.

DEARBORN COUNTY SOLID WASTE MANAGEMENT DISTRICT

Key Facts and Figures:

- Population of Service Area: 50,000

Operations Summary:

Dearborn Co SWMD collects presorted recyclables, although plastics #1 and #2 come comingled. A $15,000 conveyor is used to sort plastic #1 from plastic #2, both of which immediately go into dedicated vertical balers. A third baler (horizontal) is used to bale all other recyclables. Glass is accepted and no safety issues have occurred.

Dearborn Co SWMD advises establishing a large list of potential buyers and bartering when selling commodities in order to maximize their value.

NORTHWEST INDIANA SOLID WASTE MANAGEMENT DISTRICT

Key Facts and Figures:

- Service Area: Benton, Carroll, Jasper, Newton, Pulaski, & White Counties
- Population of Service Area: 113,000
- Recycling Revenue: The recycling program is showing a profit for the first time in 2010.

Operations Summary:

Within this six county district there are several curbside collection programs that pick up single stream recycling in addition to many drop-off locations at which recycling must be turned in presorted. Northwest Indiana SWMD collects newspaper, cardboard, comingled plastics (#1-#7 including Styrofoam, plastic film, etc.), mixed glass, and metal cans (steel/aluminum). Comingling the plastics has been functional for marketing the material. Although they receive only $.06/lb instead of about $.20/lb, they collect a much larger volume of plastic now. Also, because plastics only comprise a small fraction of recycling revenue, overall revenue remains relatively unaffected.

The recyclables are taken to the District's MRF in Pulaski County. At the MRF community service labor is used to operate the six balers (2 horizontal, 4 vertical) and bale all of the recyclables except newspaper.

Northwest Indiana SWMD has a truck and driver committed to picking up cardboard from businesses fulltime. A second truck and driver work fulltime to collect all seven other recycling streams from commercial patrons.

MARTIN COUNTY SOLID WASTE MANAGEMENT DISTRICT

Information collected through phone interviews and a site visit

Key Facts and Figures:

- Population of Service Area: 10,000
- 2009 Total Recycling Tonnage = 3,200 Tons
- 2008 Total Recycling Tonnage = 3,151 Tons
- 2010 Recycling Revenue = on track to break $400,000
- 2009 Recycling Revenue = $243,000
- 2008 Recycling Revenue = $378,000

Operations Summary:

Martin Co. SWMD is built primarily using revenue from recycling supplemented by a tax levy yielding about $120,000 per year. At its outset, the district was run from Director Laura Albertson's garage.

Using their own revenues, a new facility was constructed and expanded over the years to its present size of approximately 20,500 sq ft . The district is so successful that they have loaned the Martin County Economic Development Corporation $200,000 and supplied the matching funds for a grant to clean a brown field for the Martin County section of a multicounty tech park near the Crane Naval Surface Warfare Center. The Martin Co. SWMD is approximately a $600,000 per year operation, only 20% of which is covered by public support; the remainder is covered by the levy reference above.

It is important to note that the $600,000 covers collection services as well as the MRF operations. Profits from the sale of recovered materials and from the levy have allowed the district to maintain a cash balance of approximately $300,000 to $600,000. This balance provides a cushion for market downturns and has been used by the county to fund the economic development activities described above.

Drive-through recycling drop-off at Martin Co. SWMD's recycling facility. Staff are present to assist anyone who needs help unloading their recyclables.

Martin Co. SWMD also has established agreements with neighboring counties and has begun to be a regional hub for recycling. Martin Co. SWMD handles materials from Dubois, Daviess, Orange, and Lawrence counties. They receive recycled clothing from Monroe County. Director Laura Albertson splits

profits 50%/50% with these counties. If recyclables arrive baled she splits the profits 70%/30% in favor of the source county. Approximately $100,000 per year is distributed in profits to these partners. She is willing to take recyclables from Monroe County – including shrinkwrap or other commodities not currently collected by MCSWMD.

Many innovations are increasing recycling in Martin County. Bins are prepared for travel to community events to collect recyclables, a senior pickup day cleans up hundreds of tons of waste in a single day, and they take advantage of their proximity to Crane Naval Surface Warfare Center by providing a Document Destruction Service.

Recyclables are picked up from trailers for commercial patrons. Residential patrons deliver their recyclables to a drive through drop-off center where employees are available to help those in need. Recyclables are presorted and then baled using two vertical balers and two horizontal balers. Two fulltime and four part-time workers (equivalent to 5.2 FTE, or fulltime equivalents) are at the facility to operate the balers, skid/forklifts, or perform other tasks. One of the balers was purchased from the MCSWMD over 15 years ago.

CITY OF SEYMOUR RECYCLING

Information collected through phone interviews and a site visit

Key Facts and Figures:

- Serves all of Jackson County except Brownstown, Crothersville, and Medora which have independent recycling programs.
- Population of Service Area: 33,000
- 2009 Total Recycling Tonnage: 2124 Tons
- 2008 Total Recycling Tonnage: 1952 Tons

- 2007 Total Recycling Tonnage: 1844 Tons
- 2009 Recycling Revenue: $140,000
- 2008 Recycling Revenue: $231,000
- 2007 Recycling Revenue: $228,000

Operations Summary:

Seymour's recyclables are primarily collected through their curbside pickup program, although they do also maintain drop-off locations. One particularly successful location is their 24 hr station, at which they sometimes even attract patrons from outside of Jackson County. Curbside pickup is dual stream and must be hand sorted.

The sorting line begins with removing milk jugs, which are natural #2 HDPE – a higher grade of #2 HDPE that receives a better price on the market. The recyclables then pass under a magnetic head on a cross-belt that removes steel. Although this steel must still be hand-checked as it is loaded into the baler (glass jars may be nested inside cans, etc.) the process is much more efficient than before. The most noticeable difference is the increase in quality of aluminum, which is no longer as contaminated with steel. After steel is pulled out, manual sorters separate out glass by color and aluminum cans.

They have had no safety issues with glass other than some minor cuts; cuts have only occurred when sorters have failed to wear their gloves. Recycling Supervisor Matt Otte also emphasized the need for strict oversight with safety goggles, as glass bottles sometimes shatter with surprisingly strong force when they are struck at an odd angle. They have been sorting glass by hand for several years without issue. When Seymour was using a glass crusher there were serious injuries from accidents and their efficiency was no higher. They presently use a backhoe to smash the glass while it sits in the outdoor cullet bays.

Glass in their comingle has not caused a significant issue with contamination. Otte did note that the extremely shattered glass is not sorted out and ends up in residue (waste).

Seymour bales recyclables using two EX63 balers, which they highly recommend. They also have an old donated vertical baler from Wal-Mart dedicated to plastic bags. One horizontal baler is dedicated to cardboard and the other one for other recyclables. When maintenance issues have arisen they've been able to keep up using one baler without requiring overtime but it is difficult.

The city's resources are extremely helpful. Seymour's own maintenance personnel are able to service and repair the balers as the city has three full-time mechanics. If Otte instructs them that the need is urgent, they'll usually respond within a few hours. No problems have arisen with equipment that have been beyond the mechanics' ability to diagnose and repair. We were informed by Otte that the balers are not mechanically complicated.

In order to manage holidays or employee illness, Otte is able to draw extra workers temporarily from the city's concrete crew. For example, on Tuesday June 1st Otte will have six extra workers from the

concrete crew because they will pickup both the Monday and Tuesday routes in one day as a result of the Memorial Holliday.

The facility is staffed by five FTEs (full-time equivalents or 200 man hrs/week), but would certainly need to be more for a facility handling more than twice the volume, as Monroe County will have if the Solid Waste Management District and City of Bloomington combine their recycling streams.

Best Practices Considerations

BALER PERFORMANCE AND COST

Of the key informants who had the most experience with various balers, Excel balers are the most highly recommended by both vendors (Quincy Recycle, Environment Link) and MRF operators such as Matt Otte in Seymour. Excel also significantly underbid the ballpark figures provided by other baling companies. Additionally, they were the only company willing to offer an exact quote on machinery. The Excel 1-2-3 warranty is 1 year labor, 2 years parts, and 3 years structural/cylinder and comes standard. Estimates for the baler setup provided by each corporation was optimally suited to an operation handling 20-30 tons of material per day as detailed below:

Excel Balers (through Environment Link)	$166,768.00
International Baler Corp.	$260,000.00
American Baler	$225,000.00-$240,000
CP Manufacturing	$280,000.00

In addition to purchasing balers, both Quincy Recycle and Environment Link will lease balers to the District. Quincy Recycle also has options that would involve providing balers on the basis of profit sharing the value of the recyclables. (We have not yet received figures from the vendors for leasing the machines as of the date of this report.)

Left: An EX63 baler from Excel at the Seymour Recycling Center.

BALER SERVICE CONTRACTS

Preventative maintenance is generally not expensive, as reported by many MRFs, although costs vary greatly depending on how well service companies can fit the MRF into a route. Planning service checkups well in advance is helpful. Emergency maintenance can be more costly if a mechanic is not nearby, and their travel expenses must be covered.

Extensive repair maintenance contracts can be obtained if a MRF partners with a private firm and grants them exclusive marketing rights to their material for an extended period. Quincy Recycle offers such contracts in three year lengths.

None of the MRFs interviewed have an exclusive contract for maintenance at this time.

Monroe Co. SWMD's old baler purchased by Martin Co. SWMD over fifteen years ago still up and running. Albertson indicated that they have virtually no mechanical problems with their balers.

IMPACT OF NUMBER OF BALERS ON SPACE REQUIRED FOR TIPPING FLOOR

Extra balers are used to save tipping room floor by many of the MRFs interviewed. Posey Co. SWMD, Martin Co. SWMD, Northwest SWMD, and City of Seymour all have a single vertical baler dedicated to plastic bags because of the huge amount of space required to store an entire bale worth of plastic bags.

For most streams of recyclables, however, MRF operations report that a large amount of tipping floor space is not required so long as balers have the capacity to keep up with daily intake.

Patty shows off her work station as Patrick examines the flow of material from a paper shredder into a baler. Notice the pictures hanging on the rails and baler – Patty's personalization of her work space is one of many signs that Martin Co. SWMD workers have a strong sense of pride in their work and for their facility.

SQUARE FOOTAGE NEEDS

Standard MRF space needs are described in a technical study for facilities managing 10 tons of material per day (TPD), 100 TPD, and 500TPD.[2] The Monroe County SWMD MRF would most likely be handling 25 tons on an average day (combining the 13TPD City of Bloomington Stream with the 12TPD program at the District. Interpolating from these standards provides the following data for a facility running approximately 30 TPD:

- 2-Days Tipping Floor = 5,000 sq ft
- 3-Days Tipping Floor = 6,000 sq ft
- Processing Space = 13,000 sq ft
- 1 Week Commodity Storage = 2,700 sq ft
- 2 Weeks Commodity Storage = 5,400 sq ft
- 4 Weeks Commodity Storage = 11,000 sq ft

Even using the fully recommended *3 days tipping floor space* and *one month of indoor storage space* a facility at 30TPD would typically need no more than 30,000 sq ft. In fact, a 100TPD facility with 3 days of

[2] *Handbook: Material Recovery Facilities for Municipal Solid Waste*, Peer Consultants, P.C. and CalRecovery, Inc., 1991, pg. 74.

tipping floor space and a full month of storage space typically requires 66,000 sq ft: exactly the size of the Otis Elevator property MCSWMD has proposed to develop into a MRF.

The extra space is an obvious blessing. Posey Co. SWMD emphasized that – regardless of what standards say – you're likely to find a constructive use for any amount of space you have. The standards themselves say "The MRF building should be constructed as large as possible and designed for future expansion." Both Martin Co. SWMD and the City of Seymour use a relatively open design. While it would be possible for them to exist in a more dense space their current set up allows for a cleaner, more organized operation, likely decreasing contamination and increasing processing efficiency.

Martin Co. SWMD's storage area for baled recyclables.

LAYOUT OF TRUCK BAYS AND LOADING/UNLOADING STRATEGIES

Nearly all MRF facilities simply have doors large enough for trucks to drive into a large, open room and dump their contents on the floor. If material needs to be further sorted it is lifted and loaded into a feeder for the sort line using a skid lift. The City of Seymour's collection trucks haul containers that are small enough to be directly placed into an elevator that automatically dumps them into their sort line. The key principals are:

- To keep enough open space to allow forklifts carrying bales to easily maneuver
- To minimize the distance between the tipping floor and unloading area
- To minimize the distance that bales must be carried to the loading area

Martin Co. SWMD's recent expansion: an open space with a large door for use primarily as tipping floor.

USE OF AUTOMATION VS. LABOR

Data from the MRF standards used in Tennessee recommends a staff of 8-12 people for a MRF design similar to the proposed facility. The current proposal staffs the MRF with 8 personnel: 5 sorters, 2 baler operators, and 1 foreman. Multiple sorting equipment manufacturers have mentioned that using only five sorters sounds low to them for a facility that manages 30TPD (tons of material per day). As this is toward the minimum end of staffing requirements, it is likely that this will require a ferrous separator and a non-ferrous separator in order to be successful, if not also a heavy-light separator.

Machinex has provided the most competitive quotes currently received for sorting equipment.

FERROUS SEPARATION (STEEL)

Typically uses overhead electromagnet: offers good performance (95-98% recovery) and costs $35,000 plus installation. Because it is not trivial to differentiate steel from aluminum, this piece of equipment is difficult to replace with manual labor and is recommended for any MRF design.

NON FERROUS SEPARATION (ALUMINUM)

To have eddy current separation installed at the end of the sorting line will cost approximately $75,000. This type of unit gives an average of 95% efficiency.

HEAVY LIGHT SEPARATOR (SEPARATION OF GLASS FROM PLASTIC)

The new trend is to use a glass breaker screen. The container stream is processed through the machine, glass comes out as a fine fraction while the rest of the stream flows out of the machine free of 95% of the glass content. This will cost about $55,000.

If a conventional heavy/light separator is required it will not contaminate plastic as severely but will cost $125,000 and requires much more floor space.

HIRING ADDITIONAL SORTERS

The capital expense of non ferrous separation and heavy light separation could probably be avoided by hiring two additional sorters, increasing labor expenses by about $60,000/yr, but lowering the initial capital expense by as much as $180,000.

Cost Assessment Report – Capital Costs

Retrofitting of Property (Appendix A)	
Base Project Budget to Allow Occupancy	$205,252
Value Added Considerations (weatherization, etc.)	$46,020
	$251,272
Baling Equipment	
EX63 Horizontal Baler	$56,552
4823 48” In Ground Rubber Belt Conveyor	$23,282
Freight & Loading from St. Charles, MN to Bloomington, IN	$1,600
Factory Installation	$2,400
Subtotal x2 (need 2 balers)	$83,384 x 2
	$166,768
Estimated Additional Installation Costs:	
Pits for Pit Conveyors	$10,000
Electrical Hookup for ~5 3-phase machines + ~400ft insulated wire	$6,000
	$16,000
Additional Equipment Estimated Costs:	
Roll-off Truck	$85,000
Sorting Conveyors	$20,000
Ferrous Separator - Magnetic Cross-Belt Conveyor	$35,000
	$140,000
Total Estimated Cost With Minimal Sorting Automation:	***$574,500***
Further Sorting Equipment Costs:	
Non-Ferrous Separator – Eddy Current Separator	$75,000
Heavy Light Separator – Plastics/Glass Separation	$125,000
Total Estimated Cost With Sorting Automation:	***$774,500***

LEASING TO REDUCE CAPITAL COSTS

Industrial equipment such as sorters and balers can be leased instead of purchased.

Lease Options for Excel EX 63 Baler (all terms on a per machine basis):			
Est. Lease Amount:	**$166,600**		
Term:	36 Months	48 Months	60 Months
Advance:	2 Payments	2 Payments	2 Payments
Payment Cost:	$5,099.60	$3,958.43	$3,274.36
Lease Factor:	.03061	.02376	.01966
Annual Cost:	$61,195.20	$47,501.16	$39,292.32
Total Cost:	$183,585.60	$190,004.64	$196,416.60
Purchase Option:	$1.00	$1.00	$1.00

Northland Capital is also available to create similar leases for the sorting equipment and truck that the district may wish to buy. They have an established relationship with Excel (baler manufacturer) but are willing to contact and work with other manufacturer's of our choosing.

Quincy recycle may offer to allow the District to borrow balers for free in exchange for exclusive rights to market the materials produced at the MRF.

Key Findings:

- Taking a 5 year lease on the balers would reduce the capital expenses by $166,600 (from $574,500 to $407,900), and operational costs would have a net increase of $39,292.32 annually for the first 5 years and a 5 year total operational increase of $196,461.60.
- If a 5 year lease were taken on the balers and all additional equipment costs (roll-off truck, ferrous separator, conveyors) the capital expenses would be reduced by $306,600 (from $574,500 to $268,500) and operating expenses would have a net increase of $72,296.28 annually for the first 5 years and a 5 year total operational increase of $361,480.14.

CURRENT RECYCLING OPERATIONS ANNUAL COSTS AND REVENUES

The following analysis focuses on costs and revenues that may change as a result of building a MRF, beginning with current expenses that would be affected.

Transportation of Recyclables

The total cost from Hoosier Disposal for hauling recycling is almost exactly $10,000/mo. The total cost for 2009 was $120,507.15. Data for early 2010 are highly consistent with this value.

Processing of Recyclables

In 2009 the District paid $123,000 in processing fees for their recyclables.

Sale of Recyclables

In 2009 the District had $29,000 in revenue from selling recyclables.

Current Processing Operations Annual Cost

MCSWMD:	Transportation/Hauling of Recyclables	$120,000
	Processing of Recyclables	$123,000
	Total Cost	$215,000
	Sale of Recycling Revenue	-$29,000
	Current Total Annual Processing Expenses	***$215,000***

City of Bloomington Recycling

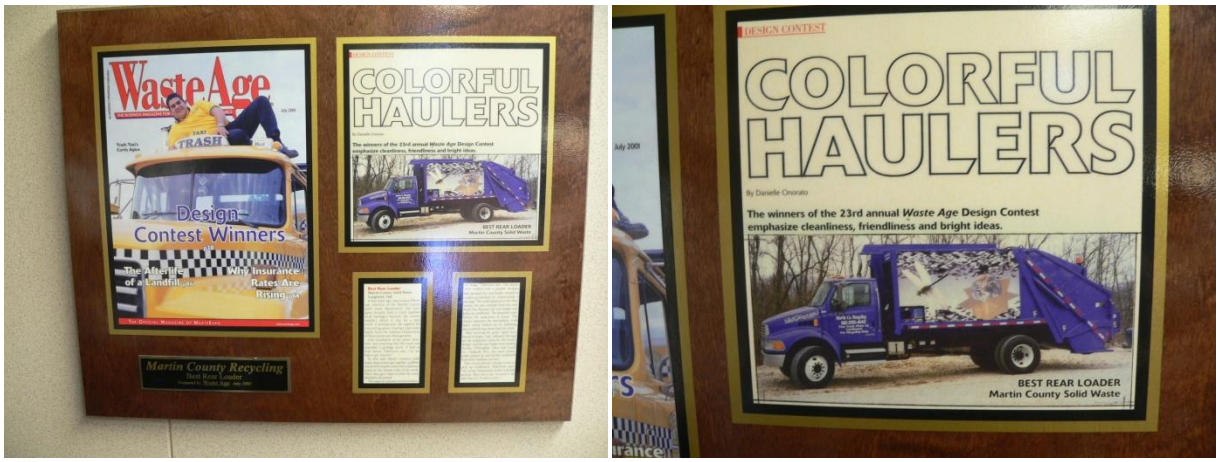
In 2009 the City of Bloomington paid **$118,000** for their recyclables to be hauled and processed.

PROPOSED RECYCLING OPERATIONS ANNUAL COST

Transportation of Recyclables

$6.50 per hour of truck use (gas, maintenance, etc.) x 30hrs x 50weeks[3]	=	$19,750
Annual salary and benefits for truck driver	=	$38,850
Transportation Cost Total	=	$58,600

Cost estimates for transportation of recyclables as they appear above assume that the District owns and operates its own truck (accounted for in capital costs) for the hauling of recyclables from collection sites to the MRF. R.W Beck estimated the hourly cost of operating a recycling truck as $6.50/hr in 2008. The $6.50 breaks down as $5 in gas, $1 in maintenance, and $0.50 in tire costs.



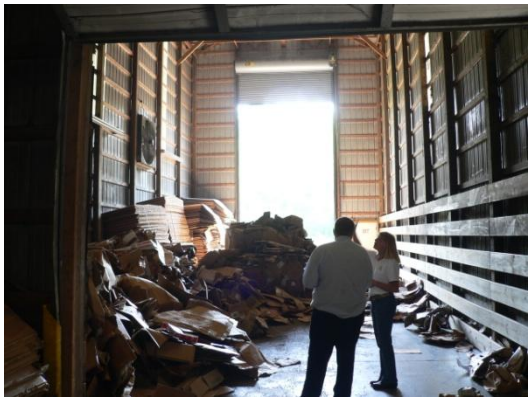
Martin Co. SWMD's recycling truck wins Waste Age Magazine's Design Contest with an elaborate design showing a dragonfly – Martin Co. SWMD's logo – stormy skies, and the Earth in a cardboard box.

Seymour Public Works' Department has unique designs promoting recycling on each truck.

[3] *RW Beck* 2008

Facility Costs

MRF Costs			
Cost	**Unit Cost**	**Low Est.**	**High Est.**
Maintenance	$2.00-$2.50/ton processed	$12,000	$15,000
Insurance	$3.00-$3.50/ton processed	$18,000	$21,000
Power	15-20kWh/ton; $0.04-$0.07/kWh	$3,600	$8,400
Water and Sewage	70GPH x 8persons x 280days x $0.002/gal.	$300	$300
Heat	0.03-0.05 MBTU/ton; $4.00-$8.00/MBTU	$600	$2,400
Fuel	0.15-0.20gal/ton; $2.00-$3.00/gal propane	$1,800	$3,600
Other Services	10% of maintenance & utilities	$3,600	$5,100
Residual Disposal	.03-.08ton/ton; $40/ton - $50/ton	$7,200	$24,000
Facility Costs Total		**$46,700**	**$79,800**
Mid-value		**$63,500**	



Maintenance, insurance, power, water and sewage, and other services are estimated exactly as dictated by the standards in the Tennessee Materials Recovery Handbook.[4] Estimates for heat, fuel (propane for forklifts/skid lifts), and residual disposal estimates have been sharpened from the established standards to better fit Monroe County specifically.

Left: Albertson explains some of the details of Martin Co. SWMD's ventilation systems; notice the high door for clearance of a hydraulic dump truck with a tall trailer.

MRF Facility Lease

Otis Elevator property lease $120,000

Additional Labor Required By MRF

Although the total labor expense for the MRF will be ~$300,000, five of the eight positions will be filled by existing staff (the foreman, the two baler operators, and two unskilled laborers). The additional staff required specifically to man the MRF are the three unskilled laborers accounted for by the above value. The following table gives the full values for the staffing costs for the MRF.

[4] *Tennessee Materials Recovery Handbook* cited from http://ctasgis02.psur.utk.edu/Environment/solid%20waste%20documents/recycling/material%20recovery%20facility%20handbook.pdf.

Table – Complete Staffing Costs

Job Level	Number of Employees	Hourly Rate	Benefits X %25	Total Cost Per Year
Unskilled Labor	5	$11.22	$2.81	$145,890.88
Baler Operators	2	$13.16	$3.29	$68,445.00
Truck Driver	1	$14.95	$3.74	$38,870.00
MRF Foreman	1	$17.58	$4.39	$45,695.00
			Total Personnel	**$298,900.88**

Because the foreman, baler operators, and two of the five unskilled laborers are already employed by the District those salaries do not represent any additional labor required as a consequence of operating a MRF. The truck driver's salary has already been accounted for under transportation expenses. This leaves only three unskilled laborers as the surplus expense required for staffing a MRF.

Job	#	Hourly Rate	Benefits (25%)	Cost
Unskilled Labor	3	$11.22	$2.81	**$87,600**

MRF Annual Processing Expenses

The total additional cost of operating a MRF is accounted for below:

MRF Annual Processing Expenses	
Transportation Cost Estimate	$58,600
Facility Costs Mid-Value Estimate	$63,500
Lease	$120,000
Additional Labor Estimate	$87,600
Increase in Total Annual Processing Expenses with MRF	***$330,000***

Operating a MRF facility would require a $330,000 increase in operating costs.

Potential Revenue: Sale of Recyclables – MCSWMD stream

The primary fiscal advantage of a MRF is the value of selling the processed commodities. Based on the range of values obtained by similar MRF operations (those with similar streams and patterns of primarily residential and commercial use as opposed to industrial), MCSWMD can anticipate receiving between $90-$125/ton. The following numbers that appear in red represent revenue instead of cost.

~Annual Tonnage		Value	Low Est	High Est	Mid-value
2,930 Tons	x	$90-$125/ton	$263,700	$366,250	$315,000

Change in Net Annual Expense of Proposed Operations

The sale of recyclables can be used to mitigate the expense of processing recyclables. The sale of the District's recyclables is likely to almost entirely offset the expense of operating the MRF.

Total Annual Processing Expenses with MRF	$330,000
Recycling Revenue Estimate	-$315,000
Annual Increase in Expense with MRF	***$15,000***

Difference in CURRENT and PROPOSED expenses:

If a MRF facility is constructed, the expense of recycling operations would drop by $215,000, a number representing the costs of running the parts of the current operation that would no longer be needed.

Projected Cost – Current Cost	***$15,000 – $215,000***	***-$200,000***

Given our projections based on historical costs and market performance, the $15,000 projected annual cost for establishing and operating a MRF is significantly less than the annual expense of the current operation and would potentially save the district $200,000 per year.

Value of City of Bloomington Recyclables

If the City of Bloomington sends their material to the same MRF as the District a great deal of further revenue can be acquired for a very minimal increase in cost.

~Annual Tonnage		Value	Low Est	High Est	Mid-value
3,120 Tons	x	$90-$125/ton	$288,800	$390,000	$340,000

Not only does the District benefit, but the City will also directly save the $118,000 annual expense paid to Hoosier Disposal to haul recyclables. The combined fiscal benefit between both the City and the District is nearly half of a million dollars.

Total Increase in Efficiency = Costs Minimized + Savings Rendered

= $118,000 + $340,000 = $458,000

Many options exist for what form a partnership between the City and the District may take. The District could accept recyclables for free, apply a small gate fee for dropping off recyclables at the MRF, or (conversely) purchase the materials from the city. If the City assists with capital expenditures, bears part of the operating expense of the MRF, or otherwise directly provides resources to the MRF, it is common to have a profit-sharing agreement. Profit sharing systems usually track the type and volume of the materials delivered. They then total the cost of processing the recyclables from a specific entity (such as the City). When the recyclables are sold, any revenue beyond the processing cost of the recycling is split %50/%50 between the MRF and the entity which contributed the materials. MRF profit sharing systems generally take into account the extent to which a party has assisted with capital expenditures or processing costs.

Durability to Market Fluctuation

The figures previously presented accurately describe markets from 2005-2010 with one exception: 2009. The crash that began in November/December of 2008 did significantly impact 2009 recycling revenues. All commodities markets fluctuate, and recyclables fluctuate more than most other commodities. Programs that worked hard at marketing their goods and that effectively used even relatively modest storage spaces to avoid selling at the worst prices still managed to obtain significant revenue from recyclables. Estimates for the proposed MRF's likely recycling revenues are made below using the crashed market of 2009 instead of market information from the other years.

MCSWMD Stream

2,930 Tons	x	$50-$75/ton	$146,500-$219,750	mid-value:	$183,000

Change in Net Annual Expense of Proposed Operations Under a Crashed Market

Total Annual Processing Expenses with MRF	$330,000
Recycling Revenue Estimate	-$183,000
Annual Increase in Expense with MRF	***$147,000***

Value of Bloomington Recyclables During Crashed Market

City of Bloomington Stream:

3,120 Tons	x	$50-$75/ton	$156,000-$234,000	mid-value:	$195,000

Total Increase in Efficiency = Costs Minimized + Savings Rendered

= $118,000 + $195,000 = $313,000

These numbers are significantly decreased from years with a stronger market, yet suggest even in a severe market crash there is room for both the City and District to improve their finances through the implementation of a MRF.

FURTHER COST REDUCING OPPORTUNITIES

Increasing the amount of material available in the recycling stream could significantly increase recycling revenue while only minimally impacting cost. Indiana University presents an opportunity for a large scale collaboration, best estimated as at least 2,000 tons/year. Although their recycling data has not been previously tracked, work being conducted in their Recycle Mania program and by graduate students within the sustainability program may bring more of this information to light. The University stream is broken into many smaller contracts that operate independently from different departments and institutions (some of which are not officially a part of the university – such as the Indiana Memorial Union and the IU Foundation). Most of these contracts are costly to the University because of the inefficiencies inherent in having many small, independent collection infrastructures. One exception is a cardboard collection program run by building operation which pulls most of the cardboard from university sources into a single stream. The university is also examining possibilities for unifying additional recycling streams; however, no action appears eminent for the near future.

MCSWMD could take the initiative to individually negotiate handling these streams. Certainly one possibility is the Indiana Memorial Union's stream of between 100-200 tons/year (at an added value of between $9,000 - $25.000 per year in recycling revenues). Their Operations Manager Gary Chrzastowski is supportive of the idea of using a local MRF and noted that the IMU had a system of centralized and sorted recycling up until recently and could easily switch back. Presumably there are other IU streams such as this one that the District could negotiate to receive in order to expand operations. Obstacles may include an inability to change program logistics to sorted streams or the lack of a central pickup location, since many IU contracts have Republic picking up a series of small containers along a route. It might be the case that these obstacles cannot be overcome for certain streams. However, there are also some compelling reasons for IU to cooperate such as the offer of a financial incentive, the opportunity for to aid the local community, and the improved environmental impact of using a local MRF facility.

It may also be possible to contract with neighboring counties to process their recyclables through the MRF. Laura Albertson, the Executive Director of Martin Co. SWMD, has arranged deals with Daviess, Dubois, Lawrence, and Orange Counties to process their recyclables at the Martin Co. MRF and profit share the revenue from the recyclables %50/%50. This regionalization strategy is effective because it maximizes the use of the MRF, thus increasing the volume of recyclables that can be used for revenue and simultaneously providing facilities to rural counties with a lower population and lower budget that might not otherwise be able to access a MRF.

ADDITIONAL ADVANTAGES TO MRF

Carbon Footprint Reduction

A major advantage to operating a local MRF that should not be overlooked is the reduction in carbon footprint from the reduced trucking demands. In addition to affecting program efficiency with respect to cost, the compacting of recyclables before shipping reduces the number of truckloads required by a factor of at least 10, alleviating more than 90% of the carbon footprint from the transportation process.

Assurance All Recyclables Are Recycled

Owning and operating a MRF is also one way to guarantee that recycled materials are indeed committed to reuse and do not end up being dumped in a landfill. Private companies are under no obligation to recycle materials they are contracted to pickup unless their contract specifically stipulates this. None of Monroe County's current contracts hold such a stipulation, although Director Larry Barker has verbally negotiated with Hoosier Disposal and Strategic Materials to ensure that materials are eventually reaching end users. However, it is impossible to know that materials are not destined for a landfill. Even contracts with end user stipulations cannot guarantee that recovered materials will not be land filled; private companies, for example, often insist on very stringent restrictions on the contamination level of recyclables and then put some materials into landfills when they fail to meet those standards.

While a very precise contract can effectively ensure that recyclables are committed to reuse, such clauses often motivate companies to offer lower prices for the commodities to compensate for the risk of being forced to manage contaminated materials. No contract offers the same level of certainty that materials are being reused as processing the materials at a local MRF and selling directly to end users – issues of contamination can be directly addressed in this process.

Path to Sustainability

Sustainability is an important goal for green communities like Bloomington. In order to achieve sustainability communities must take active steps towards reducing waste and increasing the efficiency with which they manage the waste that is produced. True sustainability will require a new infrastructure. Not only is a MRF a strong step in this direction, it also provides the opportunity to take further steps in this direction as the MRF can be upgraded to accept more streams/types of recyclables, to manage simpler sorting streams that encourage greater recycling rates, to accept recyclables on a regional basis, and many other options.

MARKETING MATERIALS

Option 1: Market and sell each truckload as soon as a full truckload of a certain material is acquired.

Advantages:

- Ensures that revenue is received in regular intervals
- Allows for bidding out each truckload to the highest bidder

Disadvantages:

- In a poor market buyer's bids will reflect the market
- Certain materials, especially glass, may not sell in a poor market, forcing some additional storage

Notes:

Spencer and Dearborn Counties both reported needing to stockpile glass for a few months during the market crash in early 2009. Neither felt it had been a serious problem or significantly disrupted operations.

Some districts such as Bartholomew County use this strategy for materials like aluminum, which accounts for about half of the recycling revenue of most residential collection programs, while using exclusive contracts for less valuable materials.

Option 2: Monitor markets and wait for favorable offers.

Advantages:

- Allows for bidding out each truckload to the highest bidder
- Allows the District to ensure products are sold when the market is reasonably strong

Disadvantages:

- May result in longer intervals between revenue collection
- Requires storage space
- Certain materials, especially glass, may not sell in a poor market, forcing some additional storage

Notes:

Requires a manager who is adept at making decisions as to when to sell based on market fluctuation.

The City of Seymour has exploited this method to great advantage. As of late May 2010, the price of aluminum was at $0.60/lb. Recycling Director Matt Otte stated that he would wait to sell and that he

could easily store the baled material until the price reached at least $1.00/lb, which would nearly double his revenue.

Option 3: Contract with specific vendors to handle certain streams year round.

Advantages:

- Requires minimum storage space
- Ensures that revenue is received at regular intervals
- Guarantees a buyer for the product

Disadvantages:

- Does not allow for the exploitation of fluctuations in demand which may cause one buyer to offer more at one time and another buyer to offer ore at another time

Notes:

This seems to be an especially popular method for managing glass by making contracts with Strategic Materials of Indianapolis.

Option 4: Create an exclusive contract to partner with a private company granting exclusive marketing rights to the materials processed at the MRF.

Advantages:

- Requires minimum storage space
- Ensures that revenue is received at regular intervals
- Guarantees a buyer for the product
- Creates a partnership with a company who then has a vested interest in the District

Disadvantages:

- Generally yields a lower offer than could be achieved by bidding streams out individually

Notes:

Quincy Recycle offers contracts for exclusive marketing rights for a District's materials and in exchange allows the District to borrow balers at no cost, provides maintenance, and will guarantee that the product is always moving so that the MRF doesn't end up with a backlog.

Monroe County Solid Waste Management District
Materials Recovery Facility Cost Assessment

June 2010

Prepared by
Strategic Development Group, Inc.
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SDg
planning & research solutions

In the Council Chambers of the Showers City Hall on Wednesday, June 30, 2010 at 7:30 pm with Council President Isabel Piedmont-Smith presiding over a Regular Session of the Common Council.

COMMON COUNCIL
REGULAR SESSION
June 30, 2010

Roll Call: Mayer, Piedmont-Smith, Rollo, Ruff, Sandberg, Satterfield, Sturbaum, Volan, Wisler

ROLL CALL

Council President Piedmont-Smith gave the Agenda Summation

AGENDA SUMMATION

The minutes of the Special Session of June 23, 2010 were approved by a voice vote.

APPROVAL OF MINUTES

There were no reports from council members at this meeting.

REPORTS:
COUNCILMEMBERS

There were no reports from the mayor or any city offices at this meeting.

MAYOR and CITY OFFICES

There were no council committee reports at this meeting.

COUNCIL COMMITTEES

President Piedmont-Smith called for public comment noting rules for participation in the civil forum.

PUBLIC INPUT

Mike Hanna commented on the letter to the Arizona Governor signed by eight council members which he erroneously believed was a Common Council resolution by vote. He said he agreed with what Arizona was doing, saying that their law was a good one. He said 'illegals' were creating havoc in Arizona and Indiana. He asked for some personal comment by any council member and offered his email address.

Merle Hedrick said he agreed with the Arizona action regarding immigration, alluding to states' rights, and added the law had nothing to do with racial profiling. He read an open letter printed in the Washington Times from actor Jon Voight to President Obama while interjecting his own religious comments.

Marc Haggerty reported that the effect of traffic calming devices in his neighborhood was remarkable. He said 90% of the traffic had been eliminated and that kids in the neighborhood were now safe. He said that neighbors related to each other in a better manner, too. He also asked that political parties find a way that third party's views could be heard in public debate. He said electoral reform would allow the country to have a better democracy.

There were no appointments to boards or commissions at this meeting.

BOARD AND COMMISSION APPOINTMENTS

There was no legislation for final action at this meeting.

LEGISLATION FOR SECOND READING

There was no legislation for first reading at this meeting.

LEGISLATION FOR FIRST READING

It was moved and seconded that the Committee of the Whole meeting scheduled for July 7, 2010 be cancelled and that instead, the council hold a special session to hear a report by the Monroe County Solid Waste Management District (MCSWD) about a proposed Materials Recovery Facility (MRF).

MOTION TO CHANGE MEETING ON JULY 7, 2010

Rollo asked if the discussion would be based on the report prepared by Strategic Development Group (SDG).
Volan said that SDG was commissioned to prepare a comprehensive report on the feasibility of the MRF with a specific site noted. He said

he felt that this was the best way to bring the discussion to the council without an obligation to cast a vote.

Motion to change 7-7-10 meeting *(cont'd)*

Sandberg asked where the report could be found. Volan said there were actually two reports. He said the June report related to the specific location of the old Otis plant, and that the April report was a general assessment of the District with an emphasis on the feasibility of a MRF and the District's operation. He said the June report and slides were distributed electronically.

Satterfield asked what impact Volan thought this report would have on the budget hearings as the project had a long way to go before it would become an item for which the city would include in the budget. Volan said that the first decision to be made by the city was interest in using the MRF for its recyclables. He said it should be considered as part of the discussion of the Sanitation Department budget. Satterfield asked when the report would be given if not at this special session. Volan said that the reports took over an hour to discuss at the District's board meetings, and that the council would need about the same amount of time, and that he was open for other suggestions as to how the reports would be presented.

Rollo asked if there would be any action taken at the end of the report. The answer from Volan was no. Rollo then asked if a quorum would be required at this meeting. Council Attorney/Administrator Dan Sherman stated that a quorum was needed in order for the council to meet. Rollo said he would like to also explore an organic sorting system and asked if this could be part of the discussion. Volan said there had not been a discussion at the District level and that it had not been formally studied, and that there would not be documentation of the process at the meeting. Volan added that the consultants and MCSWD Director would be able to address Rollo's questions during the presentation.

The motion was approved by a roll call vote of Ayes: 8, Nays: 1 (Satterfield)

Mike Hanna said the emphasis on using native trees in city landscaping was commendable. He wondered, however, how the gingko tree could then be used in some areas, and asked that they be replaced by native trees.

PUBLIC INPUT

The meeting was adjourned at 8:06 pm.

ADJOURNMENT

APPROVE: ATTEST:

Isabel Piedmont-Smith PRESIDENT
Bloomington Common Council

Regina Moore, CLERK
City of Bloomington