

WASTE AUDITS

What Is a Waste Audit?

A waste audit is a process used to determine the amount and the types of waste being generated by a group. The high volume materials identified in the audit are then targeted for reduce, reuse and recycling programs.

What Should We Do First?

Support from Management: Before beginning a waste audit, it is important that management will support the time and resources put into the audit. You also want management to seriously consider any waste reduction programs that may be recommended as a result of the audit.

Look Around: Tour the building(s) to see how many trash cans are used. Note when they are emptied and their primary use. Notice if there are any chemicals or sharp objects present that may be dangerous to handle.

Determine Time and Place where the Audit Will Take Place: You will need space to dump and sort the trash from the individual bags. Once you choose the date for the audit, do not announce it to everyone. You want the audit results to represent everyday waste practices, so it is important no one changes their waste behavior consciously or subconsciously.

Obtain Necessary Equipment and Supplies: A scale will be needed to weigh the bags and the sorted piles of trash. If a scale is not available, refer to Appendix A: "Volume to Weight Conversion Table for Recyclable Materials." Permanent markers will be needed, and cleaners/disinfectants will be necessary for cleaning the audit area once the process is complete.

Collect & Sort

Collection of Bags: The trash should be collected for sorting on a typical work day. Label each bag to identify where it was collected (i.e. 1st floor kitchen, 2nd floor copy room). As each bag is brought to the audit location, record the estimated or actual weight on the form in Appendix B: "Waste Sort Form" (in the far right column labeled "Total Weight of Bag").

Sorting the Waste: Open one bag and spread the materials on the table. Sort the waste according to the type of material (example: glass bottles, magazines, cardboard, etc.) until you've gone through the entire bag. Weigh or use Appendix A: "Volume to Weight Conversion Table for Recyclable Materials" to estimate the weights of the materials. As you collect and record data onto Appendix B: "Waste Sort Form", properly dispose waste and disinfect the area before you move on to the next bag.

Look at the Facts

Analyzing the Audit Data: Raw data from a waste audit can be used to determine many things:

- **Waste Generated Annually** – Add the weight of all the bags analyzed in the audit. Use this weight to estimate the amount of waste generated annually. For example, if one week's worth of trash was analyzed, multiply the weight of the bags by 52 to estimate the amount of trash produced by your institution in one year.
- **Composition of the waste** – Using the data recorded on Appendix B: Waste Sort Form", note the weights and volumes of materials, specifically the items that make up a large percentage of the waste stream. Discuss ideas on how they may be reduced, reused or recycled.
- **Reduce** – Can any items be reduced? For instance, if the institution employs a large number of people, there may be a significant amount of paper towels generated in the rest rooms. Electric hand dryers could be considered. Or, if there is a large amount of office paper waste, perhaps a policy could be instituted for making all documents double-sided instead of printing on only one side.
- **Reuse** – What portions of the waste stream can be reused? If there are a large number of disposable cups in the waste stream, consider a onetime purchase of reusable coffee cups that can be washed and used over and over again, or encourage staff to bring a coffee cup from home. If the company processes many shipments, opt to reuse the packing materials.

Recycle – Which items in the waste stream can be recycled? Recommend implementing recycling programs for items constituting a large portion of the waste stream, such as water bottles, office paper, aluminum and/or steel cans.

Get Educated on Trash Hauling: Tour the grounds of the facility and note the number and size of the trash collection containers. Monitor the containers over a period of time and talk to your trash hauler to determine the answers to the following questions:

- How much is paid annually for trash hauling?
- What sizes are the trash containers currently being used?
- How often the containers will be emptied and how full the containers will be when they are emptied?
- Is the cost based on the weight of the trash or the frequency of trash pickups?
- Would the hauling cost less if smaller bins were placed by the hauling company?

The data from Appendix B: “Waste Sort Form” may be used to determine the potential cost savings on trash hauling. **Do not underestimate the importance of this step**, as it is very important when it comes to justifying the cost of new recycling bins!

Prepare a Report

Using Appendix B: “Waste Sort Form” prepare a report and be ready to discuss the findings with management. The report should be easy to follow and should present the following information:

- Locations of trash bins throughout the facility
- Weight and composition of waste collected from each bin
- Recommendations on how to reduce, reuse or recycle the materials constituting the bulk of the waste from each area.
- Potential cost savings to the company.

IMPLEMENTING AUDIT FINDINGS

Recycling Containers

When planning for recycling containers, there are a few things to take into consideration:

- Looking back at Appendix B: “Waste Sort Form”, target high volume recyclable materials from each area. For instance, it may not make sense to place a recycling bin for water bottles in the copy room, just as it may not be logical to place a bin for paper in the lunch room.
- When purchasing containers, take into account the area that you have for the bins. You want the bins to fit nicely into the surroundings without being too large or jutting into walkways.
- Take the concerns of the custodial staff into account when choosing bins. The bins should be convenient to empty and not so large that they may cause injury.
- Make sure that the recycling bins are placed in convenient locations for use. If possible, place a recycling bin in every room for the type of waste that is generated there.

Many office supply and home improvement stores carry recycling bins. The following internet sites may also be helpful. Keep in mind that these companies and their products are not endorsed by the Richland County Regional Solid Waste Management Authority.

Barco Products

11 North Batavia Avenue

Batavia, IL 60510

Phone: 800-757-5460

www.barcoproducts.com

Indoor and outdoor recycling bins.

Ecolad Corporation

243 W. Congress; STE #350

Detroit, MI 48226

Phone: 800-665-6263

www.ecolad.com

Variety of indoor and outdoor recycling containers.

Recycle Away, LLC

45 Flat Street

Brattleboro, VT. 05301

Phone: 888-506-5340

www.recycleaway.com

Variety of indoor and outdoor recycling containers.

Recycling Bin.com

92 Newark Pomton Turnpike

Wayne, New Jersey 07470

Phone: 800-910-4757

www.recyclingbin.com

Variety of indoor and outdoor containers.

Rubbermaid Commercial Products, LLC

3124 Valley Avenue

Winchester, VA 22601

Phone: 800-347-9800

www.rubbermaidcommercial.com

Variety of indoor and outdoor recycling containers.

Financing

If you are fortunate, your company will be happy to buy bins, realizing that they may save money in the future on their trash hauling. If the company is not willing to spend money, you may consider not buying recycling containers to start. Instead, use cardboard boxes or bags to begin the program. If the company begins seeing a cost reduction in waste hauling, they may use this money to fund new containers, or you might purchase inexpensive bins.

Talking to Different Haulers

Make a list of all of the trash haulers in your area. Contact personal and business acquaintances to see if they might recommend a particular hauler. Before you begin calling haulers, make a list of important questions to be answered:

- Does the hauler offer recycling services? If so:
- Is the recycling free to its trash customers?
- What types of materials do they accept and how must materials be sorted and prepared?
- Does the company offer recycling bins for use at no charge or for a nominal fee?
- Will the company pay for recyclables?
(This income will help justify the cost of new recycling containers.)

See Appendix C for a sample recycling contract.

Education

Education is a key component to making the new waste reduction programs a success. Prepare materials for them explaining the new programs and their roles in them. Provide everyone with reference sheets detailing how to participate (i.e. which paper items can and cannot be recycled, where packing materials that are to be reused will be stored, etc). Remember that pictures tend to make reference materials more user-friendly and the use of color will make your resources more likely to be noticed.

There are many education resources available to help you:

Internet Research: Search a specific topic or explore any of the following web sites for helpful information:

- California Department of Conservation: www.bottlesandcans.com

- Can Manufacturers Institute: www.cancentral.com
- Container Recycling Institute: www.container-recycling.org
- U.S. EPA Wastewise Program:
www.epa.gov/epawaste/partnerships/wastewise/index.htm
- American Chemistry, Learning about Plastics:
www.americanchemistry.com/s_plastics/
- Reduce your Waste – an Interactive Tool to help Businesses Manage Waste Effectively:
www.reduceyourwaste.org

Library: Many books are available at local libraries regarding recycling and waste reduction.

APPENDIX A
VOLUME OF WEIGHT CONVERSION TABLE FOR RECYCLING MATERIALS

PAPER			PAPER		
MATERIAL	VOLUME	EST WT (lbs)	MATERIAL	VOLUME	EST WT (lbs)
LEDGER			LEDGER		
LOOSE	1 CUBIC YARD	250-400	LOOSE	1 CUBIC YARD	250-400
COMPACT	1 CUBIC YARD	700-925	COMPACT	1 CUBIC YARD	700-925
MIXED OFFICE			MIXED OFFICE		
LOOSE	1 CUBIC YARD	110-380	LOOSE	1 CUBIC YARD	110-380
COMPACT	1 CUBIC YARD	610-755	COMPACT	1 CUBIC YARD	610-755
NEWSPAPER			NEWSPAPER		
LOOSE	1 CUBIC YARD	360-505	LOOSE	1 CUBIC YARD	360-505
COMPACT	1 CUBIC YARD	720-1000	COMPACT	1 CUBIC YARD	720-1000
CORRUGATED CARDBOARD			CORRUGATED CARDBOARD		
LOOSE	1 CUBIC YARD	100	LOOSE	1 CUBIC YARD	100
COMPACT	1 CUBIC YARD	400	COMPACT	1 CUBIC YARD	400
BALED	1 CUBIC YARD	900	BALED	1 CUBIC YARD	900
PLASTIC			PLASTIC		
MATERIAL	VOLUME	EST WT (lbs)	MATERIAL	VOLUME	EST WT (lbs)
PETE # 1			PETE # 1		
WHOLE BOTTLES	1 CUBIC YARD	35	WHOLE BOTTLES	1 CUBIC YARD	35
WHOLE BOTTLES (BALED)	1 CUBIC YARD	515	WHOLE BOTTLES (BALED)	1 CUBIC YARD	515
WHOLE BOTTLES	GAYLORD	46.5	WHOLE BOTTLES	GAYLORD	46.5
2-LITTER BOTTLES	8 BOTTLES	1	2-LITTER BOTTLES	8 BOTTLES	1
HDPE #2			HDPE #2		
WHOLE	1 CUBIC YARD	24	WHOLE	1 CUBIC YARD	24
WHOLE, COMPACT	1 CUBIC YARD	270	WHOLE, COMPACT	1 CUBIC YARD	270
OTHER PLASTICS			OTHER PLASTICS		
LOOSE	1 CUBIC YARD	50	LOOSE	1 CUBIC YARD	50
COMPACT,BALED	1 CUBIC YARD	550	COMPACT,BALED	1 CUBIC YARD	550
GLASS			GLASS		
MATERIAL	VOLUME	EST WT (lbs)	MATERIAL	VOLUME	EST WT (lbs)
BOTTLES			BOTTLES		
WHOLE	1 CUBIC YARD	600	WHOLE	1 CUBIC YARD	600
SEMI-CRUSHED Manually Broken	1 CUBIC YARD	1040	SEMI-CRUSHED Manually Broken	1 CUBIC YARD	1040
CRUSHED Mech. Broken	1 CUBIC YARD	2250	CRUSHED Mech. Broken	1 CUBIC YARD	2250

		ALUMINUM CANS				ALUMINUM CANS		
MATERIAL	VOLUME	EST WT (lbs)	MATERIAL	VOLUME	EST WT (lbs)	MATERIAL	VOLUME	EST WT (lbs)
WHOLE	1 CUBIC YARD	62.5	WHOLE	1 CUBIC YARD	62.5			
FLATTENED	1 CUBIC YARD	193	FLATTENED	1 CUBIC YARD	193			
MANUALLY COMPACTED	1 CUBIC YARD	340	MANUALLY COMPACTED	1 CUBIC YARD	340			
BALED	1 CUBIC YARD	445	BALED	1 CUBIC YARD	445			
		STEEL CANS				STEEL CANS		
MATERIAL	VOLUME	EST WT (lbs)	MATERIAL	VOLUME	EST WT (lbs)	MATERIAL	VOLUME	EST WT (lbs)
WHOLE	1 CUBIC YARD	150	WHOLE	1 CUBIC YARD	150			
FLATTENED	1 CUBIC YARD	375	FLATTENED	1 CUBIC YARD	375			
BALED	1 CUBIC YARD	850	BALED	1 CUBIC YARD	850			
		ORGANICS				ORGANICS		
MATERIAL	VOLUME	EST WT (lbs)	MATERIAL	VOLUME	EST WT (lbs)	MATERIAL	VOLUME	EST WT (lbs)
		YARD TRIMMINGS				YARD TRIMMINGS		
LOOSE LEAVES	1 CUBIC YARD	225	LOOSE LEAVES	1 CUBIC YARD	225			
GRASS CLIPPINGS	1 CUBIC YARD	400	GRASS CLIPPINGS	1 CUBIC YARD	400			
LOOSE BRUSH	1 CUBIC YARD	300	LOOSE BRUSH	1 CUBIC YARD	300			
		FOOD WASTE				FOOD WASTE		
SOLID/LIQUID FATS	55 GAL DRUM	405	SOLID/LIQUID FATS	55 GAL DRUM	405			
KITCHEN WASTE	1 CUBIC YARD	850	KITCHEN WASTE	1 CUBIC YARD	850			
		CONSTRUCTION & DEMOLITION				CONSTRUCTION & DEMOLITION		
MATERIAL	VOLUME	EST WT (lbs)	MATERIAL	VOLUME	EST WT (lbs)	MATERIAL	VOLUME	EST WT (lbs)
TEXTILES, LOOSE	1 CUBIC YARD	240	TEXTILES, LOOSE	1 CUBIC YARD	240			
TEXTILES, BALED	1 CUBIC YARD	480	TEXTILES, BALED	1 CUBIC YARD	480			
CAR TIRE	ONE	12-20	CAR TIRE	ONE	12-20			
TRUCK TIRE	ONE	60	TRUCK TIRE	ONE	60			
USED MOTOR OIL	1 GALLON	7	USED MOTOR OIL	1 GALLON	7			
CAR BATTERY	ONE	33	CAR BATTERY	ONE	33			
		GENERAL				GENERAL		
MATERIAL	VOLUME	EST WT (lbs)	MATERIAL	VOLUME	EST WT (lbs)	MATERIAL	VOLUME	EST WT (lbs)
BALE 30"x48"x60'	1.85 CUBIC YARD 50 CUBIC FEET		BALE 30"x48"x60'	1.85 CUBIC YARD 50 CUBIC FEET				
BALE 30"x48"x72"	2.22 CUBIC YARD 60 CUBIC FEET		BALE 30"x48"x72"	2.22 CUBIC YARD 60 CUBIC FEET				
55 GALLON DRUM	¼ CUBIC YARD (.278)		55 GALLON DRUM	¼ CUBIC YARD (.278)				
*SOURCE: OHIO DEPARTMENT OF NATURAL RESOURCES/ DIVISION OF RECYCLING AND LITTER PREVENTION, "COORDINATORS GUIDE TO WORKPLACE RECYCLING" FEBRUARY, 1995, APPENDIX C.								

APPENDIX B
WASTE SORT FORM

Receptacle Number	Receptacle Location		Food Waste	Cardboard	Newspaper & Magazine	Other Paper	Aluminum Cans	Steels Cans	Glass Bottles	Other	Total Weight of Bag (TW)
1	Component Weight(cw)										
	% of waste stream*										
2	Component Weight(cw)										
	% of waste stream*										
3	Component Weight(cw)										
	% of waste stream*										
4	Component Weight(cw)										
	% of waste stream*										
5	Component Weight(cw)										
	% of waste stream*										
6	Component Weight(cw)										
	% of waste stream*										
7	Component Weight(cw)										
	% of waste stream*										
8	Component Weight(cw)										
	% of waste stream*										
9	Component Weight(cw)										
	% of waste stream*										

*To calculate the percentage of the waste stream, divide each component weight (cw) by the total weight of the bag and multiply by 100. % of waste stream = $cw / tw \times 100$

APPENDIX C

“SAMPLE” CONTRACT

This agreement (the "Agreement"), made between [name of recycling company], located at [address], (the "Recycler"), and [name of management company] (the "Management"), is to state the terms and conditions under which Recycler will furnish to Management located [address of the building] (the "Building") the following recycling services.

1. **Services to be Performed:** Recycler will pick up a maximum of six (6) 3-yard bins of paper, three (3) pallets of cardboard and two (2) bins per week as specified in Schedule A attached from the collection area in the Building.

2. **Insurance:** Recycler will carry complete worker's compensation, public liability, and property damage insurance.

3. **Payment:**

a. (Option 1) Management agrees to pay Recycler [\$ dollar amount] per month for services to be performed as described in Section 1 above and Schedule A attached.

(Option 2) Recycler agrees to pay Management [Dollar amount/Percentage of market value] for value of materials.

b. (Option 1) Management agrees to render such payments to Recycler on a monthly basis. Payments shall be made by check or money order to [name and address of recycling Co.]

(Option 2) Recycler agrees to render such payments to Management on a monthly basis.

c. **Additional Charges:** Recycler reserves the right to assess additional charges in the event that Management doesn't comply with the terms and conditions specified in Schedule A.

4. For materials that are incorrectly separated, additional charges, which may be assessed, are \$15.00 per bin for 1.5 yard bins; \$25.00 per bin for 3.0 yard bins; \$55.00 per bin for 4.0 yard bins. For bins that are less than two-thirds full at collection, an additional \$75.00 per pickup may be assessed.

5. For any materials placed in bins that are not included in Schedule A, Recycler may assess Management \$50.00 per ton for those non-recyclable items.

6. **Term of Agreement:** The term of the Agreement shall commence on the date written above, and shall continue in full force and effect for a period of one year (the "Initial Term"). Upon expiration of the Initial Term, this Agreement shall be automatically renewed, unless sixty (60) days advanced written notice of termination is given by either party to the other. Either party may, at any time during the term of this Agreement, terminate this Agreement upon thirty (30) days prior written notice based on the other party's breach of this Agreement.

7. **Change of Terms:** Rates and conditions of this Agreement are subject to change upon mutual agreement by Recycler and Management.

8. **Right to Enter:** Recycler and Management agree that all stickers, bags and bins placed by Recycler are at all times the sole property of Recycler. Recycler and Management further agree that during the term of this Agreement, Recycler has the right to enter the Building to place or replace such stickers, bags and/or bins, and upon cancellation of this Agreement, Recycler has the right to enter the Building to remove all such stickers, bags and/or bins.

9. **Governing Law, Entirety of Agreement:** This Agreement shall be governed by the laws of the State of Ohio. It may be executed in several counterparts and constitutes the entire agreement for the service described. If any provision in this contract is held by any court to be invalid, void, or unenforceable, the remaining provisions shall continue in full force.

We hereby agree to the above-mentioned terms and conditions:

Date: _____

Date: _____

By: _____

By: _____

[Name and Address of Recycling Co.]

[Name and address of Management]