

## 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?**

**Get 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.

**Decide When and 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.

**Get Protective Gear:** At the very minimum, gloves, safety goggles and a first aid kit should be available for everyone weighing and sorting the trash. Eye wash stations should be available. Some groups choose to have tetanus shots given to those involved prior to the audit.

**Obtain Other 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. 1<sup>st</sup> floor kitchen, 2<sup>nd</sup> 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", dispose of the 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 one time 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 are containers emptied and how full are they when they're emptied?
- Is the cost based on the weight of the trash or the frequency of trash pick ups?
- 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 Stark-Tuscarawas-Wayne Joint Solid Waste Management District.

**Bagit© System**

The Bag Connection, Inc.

459 SW 9<sup>th</sup> Street

Dundee, OR 97115

Phone: 800-622-2448

[www.bagitsystem.com](http://www.bagitsystem.com)

Unique recycling containers with stand and bag, variety of products to promote reduce, reuse and recycle programs.

**Barco Products**

11 North Batavia Avenue

Batavia, IL 60510

Phone: 800-757-5460

[www.barcoproducts.com](http://www.barcoproducts.com)

Indoor and outdoor recycling bins, can crusher (combined crusher and container for cans) and bins made from recycled HDPE (milk jugs).

**Busch Systems International Inc.**

130 Saunders Road, Suite 7

Barrie, Ontario, Canada L4N 9A8

Phone: 800-565-9931

[www.buschsystems.com](http://www.buschsystems.com)

Variety of recycling containers for curbside, office, indoor/outdoor centralized, and multi-family programs, along with educational & promotional tools.

**Ecolad Corporation**

243 W. Congress; STE #350

Detroit, MI 48226

Phone: 800-665-6263

[www.ecolad.com](http://www.ecolad.com)

Variety of indoor and outdoor recycling containers, can crusher recycling center and Canpactor II.

**The Fibrex Group Inc.**

3734 Cook Boulevard  
Chesapeake, VA 23323  
Phone: 800-346-4458

[www.fibrexgroup.com/products.html](http://www.fibrexgroup.com/products.html)

Outdoor recycling containers made from 95% post-consumer HDPE (milk jugs) and a section of indoor recycling containers.

**One Earth Corporation West**

15517 Comino Real  
Surprise, AZ 85374  
Phone: 623-556-1160

[www.oneearthrecycle.com](http://www.oneearthrecycle.com)

Reusable, cardboard recycling containers.

**Recycling Products, Inc.**

P.O. Box 5009  
Bradford, MA 01835  
Phone: 800-875-1735

[www.recyclingproducts.com](http://www.recyclingproducts.com)

Plastic indoor recycling containers.

**Rubbermaid Commercial Products LLC**

3124 Valley Avenue  
Winchester, VA 22601  
Phone: 540-667-8700

[www.rcpworksmarter.com/rcp/products/categorylist.jsp](http://www.rcpworksmarter.com/rcp/products/categorylist.jsp)

Variety of indoor recycling containers & waste collection products.

**RecyclingBin.Com**

92 Newark-Pompton Turnpike  
Wayne, NJ 07470  
Phone: 800-910-4757

[www.recyclingbin.com](http://www.recyclingbin.com)

Indoor and outdoor recycling containers, customized orders, paper and plastic bins.

**Trash Cans & More**

800 Boylston Street, Suite 1600  
Boston, MA 02199  
Phone: 800-675-3981

[www.trashcansandmore.com/recycling-bins-C13662.html](http://www.trashcansandmore.com/recycling-bins-C13662.html)

Indoor recycling bins made from a variety of durable materials.

**Wausau Tile**

P.O. Box 1520

Wausau, WI 54402-1520

Phone: 800-388-8728

[www.wausautile.com](http://www.wausautile.com)

Decorative outdoor recycling bins.

**Windsor Barrel Works**

P.O. Box 47

Kempton, Pennsylvania 19529

Phone: 800-527-7848

[www.windsorbarrel.com](http://www.windsorbarrel.com)

Some containers made from 100% recycled post consumer plastic, many indoor and outdoor recycling containers, customized orders.

## 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.

The Stark-Tuscarawas-Wayne Joint Solid Waste Management District is able to work with schools and government facilities to provide recycling bins at no charge. For more information on this program, please check our web site at [www.timetorecycle.org](http://www.timetorecycle.org).

## Talking to Different Haulers

Make a list of all of the trash haulers in your area. Talk to friends and other companies 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 they be prepared and sorted?
  - Does the company offer recycling bins for use at no charge or for a nominal fee?
  - Will the company pay for recyclables such as paper or metals? (If so, 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:

**Presentations:** The Stark-Tuscarawas-Wayne Joint Solid Waste District employs education specialists that will speak to your group at no charge. To schedule a presentation to fit your needs, call the Solid Waste District at 1-800-678-9839.

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

- California Department of Conservation: [www.bottlesandcans.com](http://www.bottlesandcans.com)
- Can Manufacturers Institute: [www.cancentral.com](http://www.cancentral.com)
- Container Recycling Institute: [www.container-recycling.org](http://www.container-recycling.org)
- U.S. EPA Wastewise Program:  
[www.epa.gov/epawaste/partnerships/wastewise/index.htm](http://www.epa.gov/epawaste/partnerships/wastewise/index.htm)
- American Chemistry, Learning about Plastics: [www.americanchemistry.com/s\\_plastics/](http://www.americanchemistry.com/s_plastics/)
- Reduce your Waste – an Interactive Tool to help Businesses Manage Waste Effectively:  
[www.reduceyourwaste.org](http://www.reduceyourwaste.org)

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

**APPENDIX A**

**VOLUME TO WEIGHT CONVERSION TABLE FOR RECYCLABLE MATERIALS**

<b>PAPER</b>		
<b>Material</b>	<b>Volume</b>	<b>Est. Weight (lbs.)</b>
<b>Ledger</b>		
Loose	1 cubic yard	250-400
Compacted	1 cubic yard	700-925
<b>Mixed Office</b>		
Loose	1 cubic yard	110-380
Compacted	1 cubic yard	610-755
<b>Newspaper</b>		
Loose	1 cubic yard	360-505
Compacted	1 cubic yard	720-1,000
<b>Corrugated Cardboard</b>		
Loose	1 cubic yard	100
Compacted	1 cubic yard	400
Baled	1 cubic yard	900
<b>PLASTICS</b>		
<b>Material</b>	<b>Volume</b>	<b>Est. Weight (lbs.)</b>
<b>PETE #1</b>		
Whole Bottles	1 cubic yard	35
Whole Bottles (Baled)	1 cubic yard	515
Whole Bottles	gaylord	46.5
2-Litter Bottles	8 bottles	1
<b>HDPE #2</b>		
Whole	1 cubic yard	24
Whole, Compacted	1 cubic yard	270
<b>Other Plastics</b>		
Loose	1 cubic yard	50
Compacted, Baled	1 cubic yard	550
<b>GLASS</b>		
<b>Material</b>	<b>Volume</b>	<b>Est. Weight (lbs.)</b>
<b>Bottles</b>		
Whole	1 cubic yard	600
Semi-Crushed (manually broken)	1 cubic yard	1040
Crushed (mechanically)	1 cubic yard	2,250
<b>ALUMINUM CANS</b>		
<b>Material</b>	<b>Volume</b>	<b>Est. Weight (lbs.)</b>
Whole	1 cubic yard	62.5
Flattened	1 cubic yard	193
Manually Compacted	1 cubic yard	340
Baled	1 cubic yard	445

<b>STEEL CANS</b>		
<b>Material</b>	<b>Volume</b>	<b>Est. Weight (lbs.)</b>
Whole	1 cubic yard	150
Flattened	1 cubic yard	375
Baled	1 cubic yard	850
<b>ORGANICS</b>		
<b>Material</b>	<b>Volume</b>	<b>Est. Weight (lbs.)</b>
<b>Yard Trimmings</b>		
Loose Leaves	1 cubic yard	225
Grass Clippings	1 cubic yard	400
Loose Brush	1 cubic yard	300
<b>Food Waste</b>		
Solid/Liquid Fats	55-gallon drum	405
Kitchen Waste	1 cubic yard	850
<b>CONSTRUCTION &amp; DEMOLITION</b>		
<b>Material</b>	<b>Volume</b>	<b>Est. Weight (lbs.)</b>
Concrete, Brick, Block	1 cubic yard	4,000
Loose Lumber	1 cubic yard	244
Wood Waste (other than pallets)	1 cubic yard	364
Pallets	one	40
<b>OTHER MATERIALS</b>		
<b>Material</b>	<b>Volume</b>	<b>Est. Weight (lbs.)</b>
Textiles, Loose	1 cubic yard	240
Textiles, Baled	1 cubic yard	480
Car Tire	one	12-20
Truck Tire	one	60
Used Motor Oil	1 gallon	7
Car Battery	one	33
<b>GENERAL</b>		
<b>Material</b>	<b>Volume</b>	
Bale 30" x 48" x 60"	1.85 cubic yd. 50 cubic feet	
Bale 30" x 48" x 72"	2.22 cubic yd. 60 cubic feet	
55 Gallon Drum	1/4 cubic yd. (.278)	

\* SOURCE: Ohio Department of Natural Resources/  
Division of Recycling and Litter Prevention,  
"Coordinators Guide to Workplace Recycling,"  
February, 1995, Appendix C.

**APPENDIX A**

**WASTE SORT FORM**

Receptacle Number	Receptacle location		Food Waste	Cardboard	Newspaper & Magazines	Other Paper	Plastic Bottles	Aluminum Cans	Steel 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*										

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

$$\% \text{ of waste stream} = \text{cw} / \text{tw} \times 100$$

## 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 Co.]