Source Reduction, Recycling, Composting, and Disposal Information and Worksheets

These pages contain helpful background information and instructions. You are encourage to read through them and complete Worksheet A, B, C and D. The worksheets are designed specifically to help you generate figures for your report. They do not need to be returned with the report forms.

SOURCE REDUCTION (WASTE PREVENTION)

Reducing waste at the source is even better than recycling. It means preventing waste from being created in the first place. There are many benefits to agencies that prevent waste. Source reduction eliminates the time, money, and labor needed to collect and manage wastes through disposal and recycling. In many cases, particularly in the office setting, waste prevention means thinking before using a resource, such as paper. We tend not to think as much about the materials we use at work, especially if we know they will be recycled later. But preventing waste in the first place has a positive impact on the environment, improves efficiency, and can save more money than recycling.

North Carolina law places source reduction and reuse at the top of the hierarchy of preferred methods for managing solid waste, followed by recycling and composting. Executive Order 156 requires state agencies to practice source reduction when feasible.

Examples of source reduction techniques common in the workplace include:

In the Office:

- Double-sided, or "duplex", printing and photocopying
- Routing or posting memos instead of distributing multiple copies.
- Using email, electronic faxing, and the web
- Reusing mailing envelopes.
- Using "two-way" envelopes.
- Getting removed from mailing lists to reduce unwanted 'junk' mail.
- Reusing foam "peanuts" and other packaging materials.

In Purchasing and Inventory Control:

- Buying supplies in bulk to reduce packaging.
- Monitoring stockrooms to reduce over-ordering and outdated inventory.
- Establishing an area for employees to exchange used items.

In Cafeterias and Break Rooms:

- Rescuing leftover or unserved food for donation to soup kitchens or charities.
- Using durable cups, plate, napkins, and utensils instead of disposables.

In Housekeeping and Maintenance Operations:

- Cleaning and reusing plastic pails and bottles.
- Reusing rags or sponges instead of using disposable paper towels.
- Collecting old clothes or uniforms for reuse.
- Buying less toxic cleaning supplies or solvents.
- Installing bypass oil filters on your agency's fleet vehicles.
- Repairing or refurbishing tools and equipment.
- Using rechargeable batteries

WASTE PREVENTION, RECYCLING, & COMPOSTING DATA COLLECTION
Data collection can help you monitor the success of your agency's waste prevention and recycling efforts as well as fulfill your agency's annual reporting obligations.

Office paper waste reduction. Use Worksheet A to calculate the amount of office paper reduced at each of your agency's facilities, institutions, and offices. **Since paper types can differ in weight and size from standard 8.5"X11" copy paper, use the conversion factors below to calculate the number equivalent reams for each kind of paper reduced.** For assistance with calculating estimates, contact DEAO at 919-707-8132.

WORKSHEET A – Office Paper Reduction Basics*

Office Paper (8.5X11.20 lb.)	**Weight**	**Volume**	**Number of Sheets**	**Paper Reduction Formulas**
One ton (2,000 lbs)	1 ton	4.33 cu yd	200,000	**Paper Reduction Factor = SheetsB –SheetsA ÷ SheetsB**
One case (10 reams/case)	50 lbs.	1.08 cu ft	5,000	
One ream (500 sheets/ream)	5 lbs.	187 cu in	500	
One sheet	0.01 lbs.	0.37 cu in	1	
One foot stack of unused paper	30 lbs.	0.65 cu in	3,000	
Other Office Paper Weight/Dimensions	**No. Reams**	**Conversion Factor**	**Reams (equivalent to 8.5x11, 20 lbs.)**	**Annual Reduction = [SheetsB X Frequency X Copies X Weight X Reduction Factor}**
E.g. 8.5x14 (legal 20 lb.)	10	1.22	12.2	
8.5x11 (letterhead 20 lb.)		1		
8.5x14 (legal 20 lb.)		1.22		
11x17 (20 lb.)		2		
Color/Inkjet (24 lb.)		1.2		
To calculate the amount of paper reduced when document length is known or can be estimated before and after a reduction activity, you will need to estimate the following information:				
SheetsB = sheets of paper that would have been used before implementing the reduction **SheetsA** = sheets of paper actually used after implementing the reduction **Frequency** = number of times per day/week/month/year the document is copied/printed **Copies** = number of copies printed or photocopied for distribution **Weight** = weight of the paper used **Reduction Factor** = percentage of paper reduced				

*Adapted from the WasteWise Tool Kit, US EPA; "Measuring the Success of Office Paper Reduction Efforts," California Integrated Waste Management Board, www.ciwmb.ca.gov/bizwaste/officepaper/measure.htm; and "Cutting Paper," Lawrence Berkeley National Laboratory, http://eetd.lbl.gov/paper/.

Recycling and Composting Totals. Use Worksheet B to record recycling data from all the individual facilities, institutions, and regional offices in your agency that recycled materials through *their own programs or contracts in this fiscal year*. When you have collected weights (in tons) from all your facilities and offices, enter them in the table. Space has been provided to mark whether the weight figures are actual (A) or estimated (E). Calculate the totals for each category and enter them in the

spaces provided on the main report form. You may copy the worksheet as needed. You do not need to include Worksheet B with your report.

Worksheet B – Recycling and Composting Totals

Fiscal Year	**July - Sept**		**Oct – Dec**		**Jan - Feb**		**March – June**		**Year Totals**
	A/E	**TONS**	**A/E**	**TONS**	**A/E**	**TONS**	**A/E**	**TONS**	**TONS**
PAPER					TOTAL FOR CATEGORY→				
Newsprint									
Corrugated Cardboard									
Magazines									
Office Paper									
Computer Printout									
Telephone Books									
Books									
Other Paper _____									
METAL					TOTAL FOR CATEGORY→				
Aluminum Cans									
Steel Cans									
Scrap /White Goods									
Other Metal _____									
GLASS					TOTAL FOR CATEGORY→				
Clear									
Brown									
Green									
Mixed Glass									
PLASTIC					TOTAL FOR CATEGORY→				
PETE #1									
HDPE #2									
Mixed Plastic									
Other Plastic _____									
ORGANICS					TOTAL FOR CATEGORY→				
Wooden Pallets									
Yard Waste									
Other Wood									
Food/Cooking Grease									
Animal Manure									
Other Organics _____									
OTHER MATERIALS					TOTAL FOR CATEGORY				
Commingled Materials									
Electronics									
Lead-Acid Batteries									
Used Motor Oil									
Tires									
Asphalt									
Other _____									
GRAND TOTALS									

SOLID WATE DISPOSAL AND COST INFORMATION

Tracking the amounts of solid waste disposed by your agency each year can help determine whether you are actually reducing waste. It is also important to keep track of costs for collection and disposal of solid waste. Source reduction, recycling, and composting are solid waste management strategies that can result in cost savings. Savings result from avoided solid waste disposal costs and unnecessary purchases. Worksheets C and D are designed to help you calculate basic information about the costs of your agency's solid waste management. It will help you estimate how much money your agency saves by recycling instead of landfilling. You may copy the worksheets as needed. You do not need to include worksheet C or D with your report.

- **Use Worksheet C to record solid waste data from all the individual facilities, institutions, and regional offices in your agency that contracted or managed the disposal of their own solid waste for this fiscal year.**
- When you have collected weights and costs from all your facilities and offices, add them together and enter in the table in Worksheet D.
- Calculate the totals and transfer them to the spaces in the main report form.
- For assistance with calculating estimates, contact DEAO at 919-707-8132.

Worksheet D – Avoided Disposal Costs

1. Total tons of solid waste disposed (Column G, Worksheet C)[1]		_____tons
2. Collection & Disposal Cost Breakdown[2]:	Collection Costs	Disposal Costs
A. Contractor/Hauler Charges[3]	$	$
B. Labor[4]	$	$
C. Equipment[5]	$	$
D. Maintenance	$	$
E. Fuel	$	$
F. Other _____	$	$
G. TOTAL COSTS		$
3. Total collection and disposal costs (add column totals from Line G)		$ /ton
4. Cost per ton of SW collection & disposal (divide Line 3 by Line 1)		$ /ton
5. Total tons recycled or composted (grand total from Worksheet B)		tons
6. Disposal and collection costs avoided (multiply Line 4 by Line 5)		$

[1] Multiply sum from Column G (Worksheet C) by 12 months. Include all solid wastes, including waste collected by private haulers or by county or municipal services. Ask your contractor for volume or weight figures or information about how to calculate weights based on your level of service. Estimate if necessary.

[2] This is a breakdown of general costs associated with most collection and disposal services. Calculate figures in the cost areas that apply to your waste collection and disposal systems.

[3] Includes related collection costs. Multiply sum from Column L (Worksheet C) by 12 months. Estimate if necessary.

[4] Remember to include all applicable labor costs (e.g. salary, benefits, etc., including housekeeping and groundskeeping. A good estimate of the proportion of housekeeping time spent on thrash collection is 25 percent.

[5] Calculate an amortized annual cost for equipment. Subtract the resale (or salvage) value from the purchase price and divide by the years of expected life. E.g., an 8 yard dumpster purchases for $800 has a six–year life expectancy. If the resale value after six years is $200, the annual cost is ($800-$200)/6, or $100.