

## Chapter Two

# Conducting a Waste Assessment

Having established the framework of your company's waste reduction program, the next step for the waste reduction team is to consider conducting a waste assessment. Some teams, especially those planning very limited programs or in companies where the waste stream is well understood, might opt to forego a waste assessment. In fact, many effective waste reduction measures can be adopted without the help of an assessment. The data generated in an assessment can, however, provide your team with a much greater understanding of the types and amounts of waste your company generates. These data can be invaluable in the design and implementation of a waste reduction program. The key steps to conducting a waste assessment are:

- ✓ *Understanding the purpose of the waste assessment.*
- ✓ *Determining the approach.*
- ✓ *Examining company records*
- ✓ *Taking a facility walk-through.*
- ✓ *Conducting a waste sort.*
- ✓ *Documenting the waste assessment.*

## The Purpose of the Waste Assessment

The waste assessment serves two basic purposes:

- To establish a baseline of data by collecting background information on a facility and its current purchasing, waste generation, and management practices.
- To identify potential waste reduction options for further evaluation.

The data you collect in the waste assessment can be used to identify and evaluate potential waste reduction options, including alternative purchasing practices, reuse, material exchanges, recycling, and composting. The waste assessment also will enable you to examine current waste reduction practices and to quantify their effectiveness. Furthermore, information generated by the assessment can act as baseline data against which the effectiveness of the waste reduction program can be evaluated.

If you do not have the time or resources to conduct a waste assessment, you might consider using industry averages of the amount of waste generated by companies in your field to approximate the amounts and types of waste your company generates. Often, waste generation estimates by general waste category can be obtained for a company's specific type of business and used as the basis for designing a waste reduction program. While this may be the easiest way to approximate your waste generation rate, these estimates are unable to account for specific conditions and may therefore result in inaccuracies. In addition, these potentially inaccurate data can hinder the evaluation process, since measuring waste reduction progress depends on comparing current waste generation data with information regarding the amounts and types of waste produced before program **implementation**.

## Determining the Approach

Planning and executing an appropriate waste assessment involves determining its scope, scheduling the different assessment activities, communicating the necessary information to employees, and performing the actual assessment. Depending on the objective of your

waste reduction program, a waste assessment can involve:

- Examining facility records
- Conducting a facility walk-through
- Performing a waste sort

Your assessment may require just one of these activities, or a combination of approaches.

The team should determine what type of assessment is best for your company based on such factors as the type and size of the facility, the complexity of the waste stream, the resources (money, time, labor, equipment) available to implement the waste reduction program, and the goals of the program. For example, if your facility generates only a few types of waste materials, your team might only need to review company records and briefly inspect facility operations. On the other hand, if

your company generates diverse types of waste and has established a goal to cut waste disposal by 50 percent, the team will need to thoroughly examine and quantify the wastes generated in most company operations by performing a waste sort. Each type of waste assessment activity is described below. The table on the following page summarizes the strengths and limitations of each activity,

## Records Examination

Examining company records can provide insight into your company's waste generation and removal patterns. The types of records you might find useful include:

- Purchasing, inventory, maintenance, and operating logs,
- Supply, equipment, and raw material invoices.
- Equipment service contracts.

## Renegotiating Your Waste Hauling Contract

*Companies implementing waste reduction programs often find that these programs offer them leverage that can be used to renegotiate their waste hauling contracts. One such firm is EG&G Pressure Science, a 300-employee aerospace design and manufacturing company located in Beltsville, Maryland. Through successful renegotiation of its waste hauling contract, Pressure Science, a division of EG&G, reduced its hauling fees after implementing a recycling program. As a result of its new contract, the company not only offset the costs of its recycling program, but saves thousands of dollars each year.*

*Pressure Science launched its recycling program as part of its effort to use waste reduction to demonstrate responsible corporate citizenship and reduce expenses at the same time. In order to determine which materials its recycling program should focus on, Pressure Science decided to sort through its company dumpster to identify the types and amounts of waste it was generating. Local county government officials conducted the sort as part of a waste reduction partnership effort between industry and government.*

*Based on the results of this sort, the company designed a recycling program targeting corrugated cardboard and office paper. Corrugated cardboard by far made up the largest percentage of the company's waste stream at 40 percent (by volume). Office paper while not representing a large portion of the waste stream, was a material that nearly everyone in the company could help recycle.*

*While this new recycling effort carried a price tag, Pressure Science recognized that this cost could be offset if it took advantage of the resulting waste reductions to renegotiate its waste hauling contract. Anticipating that it no longer would need to have its dumpster emptied three times per month, the company decided to switch to an "on-call" service. Today, Pressure Science simply calls the hauler whenever the dumpster is full. After subtracting the cost of the recycling program, this renegotiation is saving the company over \$7,000 annually.*

## Waste Assessment Approaches

<b>Method</b>	<b>Strengths</b>	<b>Limitations</b>
<b>Records Examination (Hauler Records)</b>	<ul style="list-style-type: none"> <li>• May provide accurate data on the weight or volume of waste generated at the facility.</li> <li>• Can require less time and effort than facility walk-throughs or waste sorts.</li> </ul>	<ul style="list-style-type: none"> <li>• Might not provide adequate data, if accurate waste hauling records do not exist,</li> <li>• Not likely to provide information about specific waste components.</li> <li>• Can be difficult to use if more than one business shares a dumpster.</li> </ul>
<b>Records Examination (Purchasing Records)</b>	<ul style="list-style-type: none"> <li>• Can provide data on waste generation of specific materials or products.</li> <li>• Tracks major potential waste from the point of origin.</li> <li>• Can require less time and effort than facility walk-throughs or waste sorts.</li> <li>• Can be more accurate than waste sorts for tracking small items, low-volume waste materials, and occasional or seasonal waste materials</li> <li>• Can help identify the most expensive components of a company's waste.</li> </ul>	<ul style="list-style-type: none"> <li>• Not likely to provide the full picture on waste generation,</li> <li>• If company purchasing is not centralized, can be incomplete or require substantial effort to collect and analyze.</li> </ul>
<b>Facility Walk-Through</b>	<ul style="list-style-type: none"> <li>• Can require less time and effort than waste sorts.</li> <li>• Allows first-hand examination of facility operations.</li> <li>• Can provide qualitative information about major waste components and waste-generating processes.</li> <li>• Allows interviews with workplace personnel, which can reveal waste prevention, recycling, composting, and purchasing opportunities that would not be found through records examinations or waste sorts.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Might not identify all wastes generated.</b></li> <li>• <b>Might not be representative if only conducted once.</b></li> <li>• <b>Does not provide precise information about the quantity of waste generated.</b></li> </ul>
<b>Waste Sort (Specific Functional Areas)</b>	<ul style="list-style-type: none"> <li>• Provides quantitative information about specific types of waste and functional areas appropriate if targeting specific types of waste.</li> <li>• Requires less time and effort than comprehensive waste sorts.</li> </ul>	<ul style="list-style-type: none"> <li>• Does not provide data on waste generated facility-wide.</li> <li>• Might omit major components of the facility's waste.</li> <li>• Might not be representative of the waste in the specific area if only conducted once.</li> </ul>
<b>Waste sort (Facility-Wide)</b>	<ul style="list-style-type: none"> <li>• Provides waste generation estimates for the entire facility.</li> <li>• Provides quantitative information on each waste component.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires significant time and effort to conduct.</li> <li>• Might not be representative if only conducted once.</li> <li>• Does not provide qualitative information on how or why wastes are generated.</li> </ul>

## Conducting an Effective Waste Assessment

Waste assessments can be instrumental in gathering detailed information about your company's waste. For companies that plan to focus on a particular portion of their waste, an assessment can be indispensable. At one of Quaker Oats Company's largest food processing plants, in Newport, Tennessee, company officials suspected that a few types of recyclable materials—glass, aluminum, polyethylene terephthalate (PET) plastic, and corrugated cardboard comprised a large percentage of their waste. To find out, a waste assessment was conducted in 1990 focusing on recyclable materials.

### Company Records Review

To conduct the assessment, the company setup a team of waste auditors. First, the team reviewed company records, a step that proved to be especially useful. In addition to indicating the total amount of waste generated annually, these records provided waste auditors with data on specific components of the company's waste stream. For example, shipments often arrive at the facility packaged in cardboard cartons. By researching how many cartons the facility received per year and estimating the weight of a single box, the waste auditors were able to calculate the total weight of the cardboard boxes discarded each year.

### Facility Walk-Through

Waste auditors also spent a couple of days walking through the plant, observing waste-generating processes and watching what was thrown into dumpsters. During the walk-through, the auditors solicited input from both employees and the plant's four department managers. In addition, the managers were asked to complete detailed questionnaires recording every item thrown out in their department during one week. In place of a detailed waste sort, the auditors used data from the questionnaires and checked the contents of selected dumpsters.

### Results

The waste assessment confirmed that glass, aluminum, PET plastic, and cardboard were the major components of the company's waste. Furthermore, the assessment provided highly specific data to help the company plan and set up its recycling program. With these data, the auditors were able to demonstrate to the company's management that, given the huge volume of recyclable waste the plant generated, certain pieces of equipment and capital improvements were justified. Management agreed to invest over \$130,000 in a glass crusher, a plastic granulator a horizontal baler for corrugated cardboard, and dozens of color-coordinated dumpsters (blue for bottles, yellow for plastic, and brown for cardboard).

The waste assessment data also proved useful when negotiating contracts with buyers of recyclable materials. For buyers with minimum shipment requirements, for example, plant managers were able to determine at a glance if the facility could meet the requirement. Assessment data also showed the volume of materials the company expected to process, enabling equipment vendors to recommend a machine of the correct size and capacity.

- Repair invoices,
- Waste hauling and disposal records and contracts.
- Contracts with recycling facilities and records of earned revenues from recycling.

Company records will be needed to complete Worksheet A and **Worksheet B** found at the end of this manual, Worksheet A will help the team document background information regarding the physical layout of your facility and the functions of the different departments. Your

company's current waste collection and removal practices can be documented using Worksheet B. The tables and formulas in this worksheet will enable the team to estimate your company's annual waste generation rates and the costs of collecting this waste and removing it for disposal, regardless of whether your company is charged for waste removal by weight, volume, or through a flat fee. In this way, the team can compile important baseline data against which potential waste reduction options can be measured. Company records will be needed for some portions of other worksheets in this guide, as well.

## Facility Walk-Through

The walk-through involves touring the facility (and its grounds), observing the activities of the different departments, and talking with employees about waste-producing activities and equipment. A facility walk-through is a relatively quick way to examine a facility's waste-generating practices. Specifically, the walk-through will enable the team to:

- Observe the types and relative amounts of waste produced.
- Identify waste-producing activities and equipment.
- Detect inefficiencies in operations or in the way waste moves through the organization.
- Observe the layout and operations of various departments.
- Assess existing space and equipment that can be used for storage, processing recyclable, and other activities.
- Assess current waste reduction efforts.
- Collect additional information through interviews with supervisors and employees.

While a records examination provides the team with data (such as estimates of the types and amounts of waste generated by your company), the walk-through is an opportunity to observe the connection between the types of waste generated and the actual waste-generating activities or processes. In addition, a facility walk-through that includes interviews with groundskeeping staff is a good way to assess the amount of yard trimmings generated by your company. The team should be careful during the walk-through not only to record

the types of waste observed and the ways in which waste is generated, but also to consider the potential waste reduction opportunities that lie in increasing the efficiency of these operations,

Before conducting the walk-through, the team leader should check with the managers of the departments that will be toured to avoid disrupting special deliveries, rush orders, or other department functions. He or she also can request that the supervisor and employees of each department be available during the walk-through to answer questions or describe operations. These interviews can offer important additional detail on waste generation and removal practices. Moreover, interviews help keep employees informed and interested in the evolving waste reduction program, and offer an opportunity to ask questions. Employees also can be a valuable source of ideas for reducing waste.

Worksheet C contains the information needed to organize and conduct a facility walk-through. The time necessary to complete a walk-through depends on the size and structure of your facility. For medium-sized businesses with few departments, the walk-through should be quick and relatively easy. It might take as little as an hour to tour facilities like small warehouses, office buildings, and restaurants. Teams in larger companies might need to devote more time and resources to this activity since more departments must be investigated and more employees interviewed. Large office buildings, complexes, or plants might require a day or more to tour,

## Waste Sort

If you need more data than company records or a facility walk through can provide, a waste sort can be conducted. A waste sort involves the physical collection, sorting, and weighing of a representative sample of the company's waste. The goal of the sort is to identify each waste component and calculate as precisely as possible its percentage of the waste your company generates. Depending on your needs, a waste sort can focus on the entire company's waste or target certain work areas. If the team believes one or more specific functional areas are responsible for much of the facility's waste, it may choose to concentrate its waste sort accordingly.

Worksheet D provides a step-by-step procedure for conducting a waste sort,

For some companies, it will be feasible to assemble and measure one day's worth of waste. In larger firms where this is impractical, team members might choose instead to assemble a portion of the waste from each department for measuring. However you choose to structure the waste sort, consider whether waste generation at your company varies significantly enough from one day to the next to distort results. Seasonal and periodic variations in waste generation are also common. If the potential for inaccuracy is large enough, the team might want to sort samples on more than one day. Multi-day sampling might provide a more accurate representation of the waste generated at your company. Since the data gathered in the waste sort will be used as the basis for key waste reduction program decisions, it is important that you obtain a truly representative sample of your company's waste. If a representative sample is not obtained, calculations on waste generation, waste composition, and waste removal costs can be skewed significantly,

In addition, waste reduction teams in companies with active recycling programs will need to decide whether their waste sort should measure all materials or target just the portion of the waste stream that is not currently being recycled. For a complete assessment of the types and amounts of waste being generated, the waste reduction team should locate all recycling collection areas and measure the contents to be sure that all waste components are included in the sort. If your company is more concerned with finding ways to reduce just the materials that are not being recycled, it can focus exclusively on the waste collected in company dumpsters. This might also help companies with existing recycling programs to identify the amount of materials that could have been recycled under the current program but ended up being thrown away,

To organize a waste sort, you will need to determine which waste categories to quantify. Typically, the major components of a business' waste include paper, plastic, glass, metal, and organic material such as yard trimmings and food scraps. A range of other types of waste

also can be generated by a company depending on the nature of its operations. The team also should choose whether to limit its waste sort to identifying and measuring these major waste component categories or further sorting the waste into subcategories (for example, sorting paper into such subcategories as high-grade, low-grade, newsprint, corrugated cardboard, magazines, and other). If possible, the team should strive to separate and measure the waste sample as completely as possible. These precise measurements will be useful later on when the team is determining which materials can be exchanged, reused, sold, or recycled. Also, consider whether a particular waste component needs to be measured. For example, if you know that a market for recyclable, high-grade paper exists in the area, team members might want to design the sort to ensure that this waste type is quantified accurately,

## Documenting the Waste Assessment

Once the team has determined the approach to use, it is time to perform the actual waste assessment. While examining the company's waste generation and management practices, team members also should search for opportunities to reduce waste and increase efficiency. Be sure to document all information gained through the waste assessment. Documenting your findings serves several purposes, including:

- Providing a record of the company's efforts to reduce waste,
- Developing a recordkeeping system so that costs, savings, and waste reduction quantities can be more easily tracked,
- Obtaining baseline data from which to investigate economic and technical feasibility of waste reduction options.
- Obtaining baseline data from which to evaluate the impact of these options once implemented.

In addition to guiding the waste assessment process, the worksheets will function as a record of your waste assessment activities and the data generated. Be sure to keep with the worksheets any related information you recorded during your waste assessment.