# Waste audits as a management tool

*In this lift-out tool, Robyn Pearson of Waste Audit and Consultancy Services walks us through the key steps in performing a waste audit.*

Most organisations regularly review their cost structure, examining where reductions or eliminations can be made. During this process, waste disposal costs are rarely given more than a cursory glance. In most profit and loss statements they represent less than one per cent of outgoings.

Yet this is where many organisations forego real opportunities to reduce operating costs. Waste Audit and Consultancy Services has found that the real cost of waste in organisations is regularly 10 times, and may be as high as 30 times, the cost of waste disposal as shown in the accounts.

This means that for a medium size manufacturing company with a waste disposal cost of $100,000 per annum, the real cost of waste may be in the order of $3 million. That's a cost worth reviewing.

As with any sustainable benefit, identifying the real costs of waste and how to reduce them involves a structured and methodical process. Typically this is the waste audit. The key steps in planning and conducting a waste audit are:

### STEP 1 – SCOPE THE AUDIT

- What do you want to achieve?
- What do you already know and importantly, what don't you know?
- Is compliance with legislation, codes or policy an issue?

### STEP 2 – GATHERING THE DATA OR FILLING IN THE GAPS

- What's actually in the bin?
- What is going into the treatment plant?
- How much waste do you really generate?
- How much product is going out the back door as waste?
- Why is it being generated?

### STEP 3 – DEVELOPING THE ACTION PLAN AND IMPLEMENTATION

- What do you do with the data?
- What should be addressed first, how and by whom?
- How do you ensure ongoing cost savings?

Here we will work through Steps 1 and 2. Step 3 will be discussed in the December 2002 issue of *WME*.

# Step 1: Scoping the audit

This is the most important aspect of the project. Many believe once they commence data gathering it will be easier to scope the project as more information will be available.

This leads to either information overload where everything is gathered just in case it is important, or too little data is gathered because there is no clear direction as to what is needed. Both situations can lead to poor decisions being made and lost opportunities. You need to establish the who, why, what and where of waste auditing.

**WHO** – Who are the key stakeholders? Who has an interest in the outcomes, who will impact on the outcomes, and who may input to the process?

It is important that all stakeholders are clearly identified and their role or impact determined. Identify first supporters of the audit – do you have senior management support? Have they been clearly briefed? Do they understand the resource commitment to carry out the project as well as the potential benefits?

Who is likely to impact on the audit? Production personnel, cleaners, waste contractors, maintenance.

Who do you need to assist in the process? The size of the audit and waste stream to be audited will determine how many people you need. Do not underestimate this stage. Once you have your sample to audit, you need to process it efficiently.

**WHY** – Why are you conducting the audit? Clearly identifying what you want out of the audit will determine the methodology that you must follow.

For example do you want to simply identify compliance with legislative requirements, or do you want to reduce operating costs through waste reduction? Compliance may involve a desktop review of documentation and procedures and a visual audit. Operating costs will require details on exactly what waste is being generated, where and by whom.

**A typical waste audit setup. The waste sample must be clearly defined in terms of all inputs and normal operating parameters.**

**Who has a stake in the audit? Don't forget production personnel, cleaners and maintenance staff.**

**WHAT** – The most critical question, what will you audit?

Determining the appropriate sample to be audited is important in order to ensure that extrapolations of costs and savings are accurate.

It is important to take a discreet sample capable of being clearly defined in terms of all inputs and normal operating parameters.

For example, sampling one bin of reject product randomly selected from the production line may not be appropriate if you do not know:

- how it relates to inputs; is it three per cent of raw material input or 15 per cent?
- was it generated during start-up processes or is it generated continuously throughout the process?
- does it only occur during the manufacture of certain products?
- which shift is it from?

We generally audit a 24-hour sample of the total waste, including recycled material generated by a site. This allows us to:

- relate the quantity generated to productive hours per department or machine, or number of units produced;
- extrapolate the data; and
- validate the sample against historical waste data.

Identifying the scope of the project and sample size will also allow you to determine what equipment and resources you will need to conduct the audit. A physical audit of the whole waste stream will require far more resources than a visual inspection and desktop review.

**WHERE** – While auditing on-site is the most convenient, it does present certain hazards and obstacles that must be addressed.

Ensure your audit site is in an area free from vehicle and personnel movements. It should be sheltered from the elements and large enough to hold the entire waste sample.

Importantly it should not be conducted near environmentally sensitive areas or near storm water drains or other water ways, in case of spills.

# Step 2:
# Gathering the data

It is important that Step 1 is clearly documented prior to proceeding and that all key stakeholders have signed off on the scope of the audit. You are then free to begin gathering the data.


**A waste audit is a hazardous process. A risk assessment must be carried out before starting.**

**SAFETY** – Before starting the audit, you must carry out a risk assessment of the process to ensure all hazards are eliminated, where possible, or managed where not.

A waste audit is a hazardous process which requires careful planning to ensure the safety of those conducting the audit, others on-site and the safety of the environment.

The following are examples of the types of areas that should be included in your risk assessment:

- hazards associated with the waste itself;
- the weight, volume or density of material and equipment;
- the audit site;
- the audit process;
- storage and movement of the waste; and
- surrounding environment.

It is strongly advised that your OH&S manager reviews the safety protocols and approves these prior to the audit.

## THE AUDITING PROCESS

There are a number of different types of audits. Each delivers different outcomes and requires differing levels of resources. Here we refer primarily to the detailed physical audit. The two key stages of this audit are analysis of the waste sample and site analysis.

**ANALYSIS OF WASTE** – The important thing to remember during the waste analysis is to record as much detail as possible. The audit should provide enough detail to allow you to move back up the chain to identify the real reason for the waste being generated.

**WHAT SHOULD BE RECORDED** – The waste should be analysed by department or process, by item as well as material, and by shift.

For instance, breaking it up into "start-up waste" versus "raw material waste" versus "reject packaged product waste" is better than simply "production waste". Each has a different value as the material has passed through different stages of production and may be generated for different reasons.

It is important to use categories that will be meaningful to those reviewing the results. For example, in a food manufacturing plant recording food waste as "organics" may not be as useful as recording 45kg of raw material A or 50kg of product B.

The more detailed description allows estimates of the real cost of waste to be determined. It also allows review of Bills of Material to determine if built-in waste estimates are accurate.

**HOW TO MEASURE** – At a basic level, each category should be recorded by weight and volume.

Weight is a precise measure that will allow for accurate extrapolations. Weight measurements will allow accurate cost savings in terms of waste disposal to be estimated.

Volume is an indicator of the systems that will be required to contain, transport and consolidate waste on-site.

Recording quantities can also be useful. For example, 500 pairs of gloves has more impact on an employee than 25kg of gloves. This may highlight a real issue, especially if only 100 employees were on-site during the audit period.

**SITE ANALYSIS** – The actual data obtained from the waste analysis is not useful in itself. Knowing that 300kg of packaging is rejected in plant B during day shift does not in itself provide any value. The value of the audit is in the simple task of asking why.

**Should product that is captured and reprocessed be counted as waste? Yes. While the raw material may not be waste, it has already gone through the production stages where energy, labour and water have been expended. Therefore, the reprocessed material represents a waste of resources.**

**The site analysis is often the first time anyone has asked an operator for their input or opinion.**

This process is known as the site analysis. It may involve a number of processes including:

- detailed review of site operations; observing what actually happens within departments as opposed to what should be happening;
- talking to employees about their operations and waste; asking why the packets are rejected; and
- holding focus group sessions; often the real reason for waste being generated is complex and may involve the interaction of a number of departments. Getting all parties together and discussing the findings of the audit can identify the real issues.

The site analysis requires preconceived ideas and knowledge be put aside to look at the situation with an open and enquiring mind. Often managers see only what should be happening, or what they perceive as the real situation. You many need to delve through the politics of the situation to find out the true reason.

Quite often the site analysis is the first time anyone has asked an operator for their input or opinion. As such you tend to find that they have a lot of venting to do before the real issues start to emerge.

It is important to be aware of the dynamics of the organisation and to manage these within the process. We have found implementation of the waste audit recommendations can be a powerful employee motivating tool. Working with the employees in this process not only gives them a sense of ownership, it typically ensures sound practical solutions are identified. More details on the implementation process will be provided in the next issue. ■

## IN THE DECEMBER ISSUE OF *WME*

**What does it all mean? Developing an effective waste reduction plan and implementation program. Waste Audit flowchart.**

## NOTES