

WASTE MANAGEMENT IN INDUSTRY

C L Hand

Freelance writer and editor, London, UK

Keywords: Audit, contractor, disposal, Duty of Care, hierarchy, procedures, recovery, safety, storage, transport

Contents

- 1. General principles
 - 1.1 Introduction
 - 1.2 Elements of a waste management strategy
 - 1.2.1 Choice of waste management option
 - 1.3 Duty of Care
 - 1.4 Producer responsibility
- 2. Practical guidance
 - 2.1 Safe storage and handling of waste
 - 2.1.1 Segregation
 - 2.1.2 Containers
 - 2.1.3 Waste storage areas
 - 2.1.4 Handling waste
 - 2.2 Transportation of waste
 - 2.3 Conducting a waste audit
 - 2.4 Selecting a recovery or disposal option
 - 2.4.1 Reuse
 - 2.4.2 Wastes suitable for recycling
 - 2.4.3 Wastes suitable for energy recovery
 - 2.4.4 Wastes suitable for incineration
 - 2.4.5 Wastes for which landfill is the most appropriate option
 - 2.4.6 Treatment of waste
 - 2.5 Selecting a waste contractor
 - 2.5.1 Waste Facility Site Audit
- Glossary
- Bibliography
- Biographical Sketch

Summary

This article gives practical guidance on waste management to industrial waste producers. It will be particularly helpful to smaller companies or those which do not already have a detailed environmental policy. Section 1 reviews current trends in waste management policy, with particular reference to Europe. By putting into practice principles such as the Duty of Care and producer responsibility, waste producers can avoid prosecution, prevent environmental damage and conserve resources. The key elements of a company waste management strategy are listed: as a general guide, a waste strategy should seek to divert waste from disposal into more sustainable options

such as recycling and recovery.

Section 2 gives concise practical guidelines, focusing on

- a) the management of waste on the producer's premises, looking at safe storage, handling and transportation, and
- b) selecting the Best Practicable Environmental Option for waste management, whether reuse, recycling, energy recovery, incineration or landfill. Examples are given of wastes from the chemical industry.

Two sample audit checklists are included, one for on-site waste management and one for the evaluation of potential disposal contractors.

1. General principles

1.1 Introduction

Waste, by definition, is something that the producer no longer requires and therefore discards. In many industrial economies, the traditional approach to waste has been to dispose of it as cheaply as possible, without much concern as to what happens once the waste leaves the producer's premises. This attitude is now changing as greater environmental awareness is reflected in more stringent waste management legislation and a genuine desire on the part of industry to improve environmental performance and meet customers' expectations.

The environmental risks associated with poor waste management are well known and understood. Fly tipped wastes can poison and injure children and animals as well as creating an eyesore. Carelessly disposed of liquid wastes, such as solvents, can leach into the groundwater and contaminate drinking water supplies. Poorly planned and managed landfills will create a significant neighborhood nuisance, and where landfill gas and leachate are not properly treated there will be a serious threat to the safety of local residents. Old, closed dumps and landfills are likely to be contaminated land which may be difficult or dangerous to remediate and redevelop. Incinerators operated without adequate pollution abatement equipment will release highly toxic dioxins. Even recycling and composting facilities can be a source of litter and unpleasant odor if not properly regulated. Waste producers carry their share of responsibility to ensure that such polluting incidents do not occur.

What is often overlooked by manufacturers is that waste is not only a potential source of environmental damage, but also represents a waste of their resources – raw materials, energy, water, etc. By reducing, reusing and recycling waste, manufacturers can cut costs considerably, create a cleaner and safer working environment – and perhaps even improve the quality and safety of their product.

Good waste management protects the environment and improves profitability – but for those who are not sufficiently motivated by these incentives, increasingly stringent national and international legislation is compelling many producers to review their waste procedures. In countries such as the UK and USA, the most severe waste offences

are punishable by prison sentences.

Some examples of recent waste legislation from the European Union are:

- the Waste Framework Directive, which requires all waste to be disposed of without harm to the environment or human health, demands that waste management facilities be licensed and regulated, and establishes a comprehensive definition of waste which includes materials going for recovery
- the Landfill Directive, adopted in April 1999, which will bring an end to the landfill disposal of many biodegradable wastes (seen by many as a questionable aim) and raise the standard of landfill management across the EU
- the Packaging and Packaging Waste Directive, which obliges companies to arrange for the recycling and recovery of significant quantities of the packaging they handle.

In the UK, the Duty of Care and Special (hazardous) Waste legislation lays down documentation requirements which enable consignments of waste to be tracked “from cradle to grave” – a great help in preventing fly tipping.

A fourth driver towards the more conscientious management of industrial waste is the growing popularity of environmental management systems such as ISO 14001 and the European eco-management and audit scheme (EMAS). Accreditation to one of these systems indicates that a company has a well-planned and documented set of environmental procedures, and in the case of EMAS demonstrates ongoing improvement in environmental performance. Waste management procedures will form a key element of any environmental management system.

1.2 Elements of a waste management strategy

Good waste management involves much more than ensuring that wastes are safely and legally disposed of. The aim should be to achieve the Best Practicable Environmental Option (BPEO) for each waste stream.

A typical strategy for the management of industrial waste might contain the following elements:

- initial audit of wastes produced (source, quantity, composition and hazards) and current waste management procedures
- risk assessment to ensure that storage and handling procedures do not present a health, safety or environmental risk
- investigation of opportunities for waste reduction, reuse, recycling and recovery
- assessment of waste treatment options
- determination of Best Practicable Environmental Option for disposal of remaining wastes and treatment residues
- audit of potential waste management contractors and selection of the contractor offering the best service.

Practical guidance on storage, handling and disposal can be found in section 2 of this

article.

1.2.1 Choice of waste management option

European Union waste policy is built on the concept of the Waste Hierarchy, Figure 1. This seeks to rank waste management options, with the most sustainable option being to avoid producing the waste in the first place. Waste producers are urged to “move their wastes up the hierarchy”, for example by recycling instead of landfilling. Some European governments have introduced economic instruments, such as taxes on landfill and incineration, to help facilitate this movement.

There has been much debate as to the position which energy-from-waste incineration should occupy on the hierarchy, some putting it on a level with recycling while others press for it to be classed as mere disposal. Likewise, there is debate as to whether composting constitutes recycling or recovery. The important point to remember is that the hierarchy only provides a general guide, and the waste producer should look carefully at the characteristics of each waste stream before deciding on the BPEO. For some wastes, such as bulky, inert demolition wastes, the most sustainable option is likely to be landfill, despite its position at the bottom of the hierarchy. Geographical factors such as the distance to a reprocessing or energy-from-waste plant will also help to determine the BPEO. (Another important environmental principle, the Proximity Principle, directs that waste should be disposed of at the nearest suitable facility.) Guidance on choosing a waste management option can be found in section 2.4 below.

1.3 Duty of Care

The Duty of Care is a principle taken from UK legislation which deserves more widespread application. It requires everyone in the waste chain to do all that is reasonably practicable to ensure that the waste they produce or handle does not produce environmental pollution or harm to human health – even once it has been handed over to someone else. The waste must be accompanied by an accurate description, and it must not be allowed to escape at any stage between production and final disposal.

Example of a waste chain

Producer → Carrier → Transfer station or treatment plant → Disposal site

For the producer, this duty entails:

- packaging waste securely prior to collection
- ensuring that waste is only handed over to someone who is legally entitled to receive it, such as a contractor whose site is licensed to receive industrial waste
- preparing a detailed description of the waste, including its hazards, which will accompany it on its journey
- checking others in the waste chain, to ensure they are handling and disposing of the waste correctly. This often involves auditing the disposal site as well as a routine checking of credentials.

1.4 Producer responsibility

The concept of producer responsibility lies behind the European Packaging Directive and proposed Directives on end-of-life vehicles and waste electrical and electronic equipment. While the Duty of Care requires waste producers to take responsibility for the safe transport, treatment and disposal of their waste, producer responsibility goes one step further in obliging manufacturers (and sometimes retailers) to arrange for the collection, recycling and recovery of their products once they have been discarded by the consumer. The legislation also stipulates that products should be manufactured in a way that facilitates recycling, for example by excluding certain hazardous substances.

This legislation will place considerable burdens on manufacturers, but if its aims are achieved it should conserve resources and improve efficiency in the economy as a whole. Manufacturers can prepare for these new measures by assessing the recyclability of their products and implementing “design for disassembly” – designing products which will be easy to dismantle and safe and economic to recycle. The European Commission is now seeking to develop an “integrated product policy” based on life cycle assessment, which would encourage designers and manufacturers to minimize the environmental impact of their products at every stage from design and manufacture through use to final disposal.

-
-
-

TO ACCESS ALL THE 15 PAGES OF THIS CHAPTER,
Visit: <http://www.eolss.net/Eolss-sampleAllChapter.aspx>

Bibliography

Directive 75/442/EEC (OJ L194 25.7.75) Framework Directive on Waste, amended by 91/156/EEC (OJ L78 26.3.91).

Directive 94/62/EC (OJ L365 31.12.94) Packaging and Packaging Waste

Directive 99/31/EC (OJ L182 16.7.99) Landfill of Waste

[These three items of European Community legislation illustrate the policies and objectives of EU Member States regarding industrial waste management.]

Biographical Sketch

Mrs Caroline L Hand BA MSc

Caroline Hand is a freelance writer on environmental legislation, policy and practice, specialising in waste management. She is Consultant Editor of *Croner's Waste Management Magazine* and *Croner's Waste Management* updating reference manual. Her past experience includes work at the House of Commons as Specialist Assistant to the Environment Select Committee.