



Guidelines For Preparation Of Waste Management Plans

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Introduction

Waste Management Plans (WMP's) identify cost-saving opportunities for industry and significantly reduce the production of industrial wastes.

Waste minimisation programs make good sense. The community gains a cleaner environment and industry gains a competitive edge.

The Victorian Government's Industrial Waste Management Policy (Waste Minimisation) requires waste management plans to be included in an application for a works approval or a licence amendment. They may also be required by trade - waste agreements with the local water authorities for industrial discharges into sewers.

A plan can relate to existing or planned operations.

There is no general prescription for a waste minimisation program. However, the details provided in this information bulletin will help industries to establish their own program.

Waste Minimisation Programs

A waste minimisation program for industry follows seven or eight steps, from project planning to the production and implementation of the Waste Management Plan. This is a process of continuous review and improvement.

The most important stage of a waste minimisation program is to carry out a **waste assessment**. This involves investigating production processes and raw material purchases and assessing all waste streams. Waste assessments may take several months to complete, but it is important to start the program on a sound footing. The Waste Management Plan is prepared from data collected and ideas generated during the waste assessment stage.

Commencing Your Program

1. The Project Team

Select a small project team of about two or three people. The team should have a mix of skills and could include a plant operator, engineer, chemist, or production manager. The team leader reports regularly to the Chief Executive Officer. Larger companies may need to increase the team size.

2. Project Scope

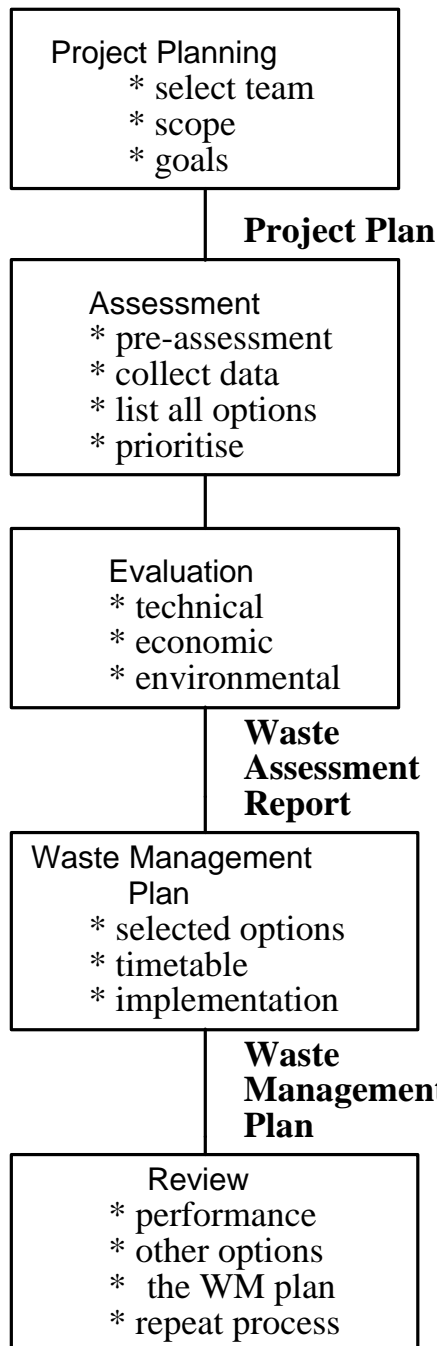
The project team **defines the project** by setting the scope of the project, including specific waste reduction goals. It may decide to **select waste assessment teams** to carry out waste assessments in different parts of the plant. For example, if there are four different production areas and a waste treatment area, the plant could be assessed by five different teams, each with a different focus. The project team would coordinate the other teams during this period. Initial decisions could be reviewed and changed later. A large number of people are not required; keeping the project simple is usually beneficial to the company.

3. Pre-Assessment Stage

The next step is the **pre-assessment stage**. A brief overview of the plant operations saves time and enables the project team to focus on critical plant areas. The project team should:

- ◆ list all production activities at the site;
- ◆ collect readily available information on each activity;
- ◆ produce an overview of all substances and materials;
- ◆ produce an overview of all wastes and emissions;
- ◆ list all environmental protection measures;
- ◆ identify all regulatory requirements for each activity;
- ◆ list all known waste or pollution problems;
- ◆ establish the priority of activities to be assessed;
- ◆ maintain an overview of the scope of the project.

Program



For more information refer to page 5, section 3.3 "Collection of Preliminary Data", in EPA Publication No. 277 *Waste Audit Guidelines*.

4. Waste Assessment Stage

The project and assessment teams, should then collect detailed information on each of the prioritised activities. A **material balance** can be a useful tool to produce details where a particular material ends up. It works on the theory that what comes into the plant must either go out in product, wastes and emissions, or be accumulated in inventory or stockpiles. This stage must be carried out carefully and can take many weeks. A program of sampling, analysis and measurement, may be required, as well as some investigation into the fate of the waste and its environmental impact. Teams should be methodical, systematic and patient. Note any ideas for later follow up during the waste assessment.

Further assistance can be obtained from EPA Publication No. 358 *Procedures for Waste Assessments* together with Section 3.5 "Comprehensive Plant Analysis" from the *Waste Audit Guidelines*.

5. Evaluation and Feasibility Stage

The project team evaluates the collected data, identifies those opportunities offering the most dollar savings or environmental benefits, and develops several options for waste minimisation projects. Analyse the technical and economic feasibility of each option to determine which of the waste minimisation opportunities should be refined or adopted.

Section 3.6 "Evaluation of Data" in the *Waste Audit Guidelines* provides further assistance.

6. Waste Assessment Report

The waste assessment report should be well documented format and include all of the collected information. It could contain considerable detail, such as commercially sensitive data, and is therefore usually an internal working document for company personnel only.

For further details refer to EPA Publication No. 358 *Procedures for Waste Assessments* and also Section 3.7 "Preparation of Report" in the *Waste Audit Guidelines*.

7. The Waste Management Plan

Both the waste assessment report and the feasibility analysis of selected opportunities is now reviewed by the project team. From this, a Waste Management Plan is produced, which contains a **timetable** and an explanation of **how** each of the selected options can be implemented. The plan should highlight the expected cost savings and environmental savings. The Waste Management Plan is not necessarily a technical document, but rather a general summary of how the assessment was conducted and how the recommended waste minimisation options were selected. It should show clearly what measures will be implemented, when they will be done, and what achievements are expected.

The Waste Management Plan must be a readable document for people outside the company. It will not necessarily contain details about confidential plant processes. The document is a starting point for minimising the production of wastes.

8. Implementation

Once the Waste Management Plan is approved by the company directors or board, the various options can be introduced into the workplace in accordance with the details in the plan. In some cases, such as with a works approval application, the plan requires the prior approval of EPA. The project team should monitor the implementation of the plan, monitor the improved performance, and periodically review the plan.

9. Review

The waste minimisation process is a journey, not a destination. Waste management plans must be periodically reviewed and updated for two reasons: first, to ensure that previous waste practices do not return and second, to identify any new waste minimisation opportunities.

Waste Management Plans

To be effective, a Waste Management Plan should contain the following information.

◆ **Background.** State the reasons for the waste assessment program and what achievements were expected. State the company's policy on environmental issues such as waste minimisation programs.

◆ **Project Planning.** State the scope of your waste minimisation program, including the location and size of the facility, the name of the senior officer responsible for overall plan implementation, and list the members of the project teams and their responsibilities.

◆ **Production Processes.** Provide a brief description of the company's operations and processes, and a general overview of the raw materials consumed and the current waste disposal methods and costs.

◆ **The Waste Assessment.** Provide a description of how the waste assessment was carried out and over what time. Was it a full - time or part - time program and what was the level of participation by employees other than project team members? What barriers or problems were encountered? Identify all waste minimisation options.

◆ **Evaluation and Feasibility Analyses.** Summarise the technical and economic feasibility analyses for each of the waste minimisation opportunities identified for implementation.

◆ **Selected Waste Minimisation Projects.** List each of the waste minimisation projects identified for implementation. Provide reasons for their selection, the expected implementation costs and the expected savings in both dollar and environmental terms.

◆ **Implementation.** For each waste minimisation project, provide a timetable for implementation or installation, and the name of the person responsible for the project.

◆ **Review.** Waste minimisation programs require periodic review to ensure that the Waste Management Plan is being adhered to and also to identify any new waste minimisation opportunities. Include a review of the efficacy of the actions taken. State your proposals for follow - up and review, which is usually 12 to 18 months after the implementation of the plan.

To be comprehensive, a Waste Management Plan should pay attention to:

- ◆ senior management involvement in the program;
- ◆ employee training and awareness;
- ◆ trade waste agreements, licences, approvals, and proposed variations;
- ◆ materials inventory for all raw materials, goods in production, and final products;
- ◆ waste materials going to air, water, sewer and land (including packaging, empty containers, paper and other wastes);
- ◆ identity of chemical classifications, according to the prescribed waste list. (Refer to the *Prescribed Waste Regulations* 1987);
- ◆ identity and quantity of all priority wastes. Priority wastes listed in Schedule A of the waste minimisation policy are:

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| <ul style="list-style-type: none">- arsenic and compounds- acrylonitrile- benzene- cadmium and compounds- chlorinated hydrocarbons- chromium and compounds- copper and compounds- lead and compounds- mercury and compounds- nickel and compounds- organo tin and compounds- ozone depleting substances- photochemically active organic substances- polychlorinated or polybrominated biphenyls or related substances- polycyclic aromatic hydrocarbons- vinyl chloride monomer |
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- ◆ best available technology (BAT) for priority wastes and commonly available technology (CAT) for others;
- ◆ process design or, in some instances, product redesign to reduce wastes. Consider especially those processes involving the priority - listed chemical wastes and whether process redesign is viable;
- ◆ applicability of alternative low waste technologies, quoting sources;
- ◆ waste minimisation options for each segment of the production process, providing details of which options were examined and the reasons for the final choices;

- ♦ options and plans to install production equipment that produces minimal or no waste, including noise reduction.

Works Approvals Applications

For works approval applications, waste management plans need not necessarily be submitted as a separate document, but can be embodied and referenced in the application. All of the relevant points outlined in this guideline should be addressed.

Where a comprehensive waste assessment has been carried out in accordance with the Waste Audit Guidelines, only a summary is required for a works approval application.

Applications can be assessed more rapidly if waste management plans are comprehensive, address all relevant points, and contain accurate information.

Other specific points to be considered are:

- optimise efficiency rates in process reactions to minimise generation of wastes
- improve the storage and handling of materials received
- eliminate sources of leaks and spills
- effective ways to handle spills
- recycle off-specification products
- recover and re-use wastes from equipment washouts
- install technologies to reduce, recycle, reclaim or treat waste
- segregate wastes for maximum recovery
- install closed-loop systems
- introduce recycling plans, either on-site, off-site or to a waste exchange
- minimise the production of wastes by eliminating or reducing packaging and drums
- examine waste storage requirements before re-use
- improve preventative maintenance on all equipment
- modify equipment to increase efficiency
- install equipment for waste recovery, recycling or treatment
- make any necessary modifications to waste treatment equipment.

Water Authorities Managing Industrial Wastes

Water authorities seeking works approvals will need to address waste minimisation, with particular attention to:

- ♦ trade wastes accepted into system, including information on waste minimisation options;
- ♦ options for sludge disposal on-site and off-site, and the reason for each option;

- ♦ education programs designed to minimise the use of water and to ensure wastes are reduced and disposed of in an appropriate manner.

Further Assistance

Waste minimisation literature and easy - to - read guidelines for the preparation of waste assessments can be obtained from your nearest EPA office or from the trade waste officer at a larger local water authority office. Professional expertise is available to assist industry develop waste minimisation programs of cooperation between government and industry.

EPA can assist with the development of a Waste Management Plan. Contact staff at the **Industry Services Unit on (03) 628 5070** for assistance and the latest information on waste minimisation programs.

EPA Publications

Industrial Waste Minimisation - Procedures for Waste Assessments. Publication No. 358

Introducing Waste Management Plans. (A requirement of your trade waste agreement.) Publication No. 363

Cleaner Production and The Water Industry. Publication No. 362

Waste Audit Guidelines. Publication No. 277

Waste Minimisation - Opportunities and Assessments. Publication No 351

Other Publications

Australian Chamber of Manufactures & Office of Environment, **Environment Management Handbook for Small Industry**

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