

# Implementation of Waste Management System

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**Abstract:** - Implementation of a waste management system is a priority for Romania. This is difficult to achieve due to the legislation, poorly qualified employees in this field, high costs, and not least because people mentality regarding the selection of waste. The case study consists on environmental impact evaluation based on implementation of waste management system where are identified and treated the significant environmental aspects.

**Key-Words:** - implementation, environmental management system, waste management, environmental aspects, SWOT analysis.

## 1 Introduction

Romania has important natural resources, raw material. Processing these raw materials it is generating wastage. The closest industrial sector is based on reprocessing of these local raw materials, and the industrial complex is made of factories and specialized shops.

Sustainable development is maintaining a delicate balance between the human need to improve lifestyles and feeling of well-being on one hand, and preserving natural resources and ecosystems, on which future generations and we depend.

The environment is the place where the organizations operate, including air, water, land, natural resources, flora, fauna, humans, relationships between them.

An Environmental Management System (EMS) is a framework developed by an organization to help improve its environmental performance by considering environmental considerations when making decisions and managing risks.

Implementation of waste management combine waste flows, waste collection, treatment and disposal methods into a practical waste management system that aims to provide environmental sustainability, economic affordability and social acceptance for any specific region. This is achieved by combining a range of treatment options including waste reduction, reuse, recycling, composting, biogasification, thermal treatment and landfilling[1]. ISO 14001:2004 is designed to address the delicate balance between maintaining profitability and reducing environmental impact; with the commitment of the entire organization, it can enable to achieve both objectives [2].

Basic steps in ISO 14001:2005 implementation are shown in figure 1.



**Figure 1. Implementation requirements**

## 2 Implementation of Waste Management System

Organizations that want to implement a waste management should participate directly in the preservation, protection and improvement of environment by:

- making decisions in accordance with the requirements of environmental protection;
- prevent pollution and damage towards the environment;
- maintaining and improving the environmental quality;
- establish a system for monitoring of environmental factors;

- sustainable use of resources and environment;
- creating of ecologically and informative program aimed at regional level.

The main strategic directions to environmental management are:

- prevent and continuous reducing of pollution;
- operation in accordance with environmental legislation and other regulations;
- implementing of integrated system in the organization to create the conditions necessary to continuous improvement of environmental performance;
- efficient use of energy, water and fuel as a form of saving natural resources and financial;
- inform all employees on environmental policy and involvement in achieving goals;
- awareness among employees and the local community of obtained results in the field of environmental protection, in order to improve the organizations image and relations with local authorities.

The case study consists on environmental impact evaluation based on implementation of waste management system where are identified and treated the significant environmental aspects.

Waste management flows in a cycle presented in figure 2. Through these steps an organization can effectively and responsibly manage waste output and their positive effect they have on the environment [4].



**Figure 2. Waste management processes**

To identify the environmental aspects are taken into account the following factors:

- Direct:

- waste management (collection, transport, storage / disposal / recycling) hazardous waste, industrial;
- pollution of soil and surface water;
- air pollution;
- environmental urbanization.

- Indirect:

- environmental (ecological) education;
- development of services;
- investment in new markets;
- administrative and planning decisions.

The identification of environmental aspects is made by analyzing processes / services, the phases, operations, service areas, taking into account normal operating conditions, startup / shutdown and possible emergencies.

The identified environmental aspects are analyzed for selecting the significant environmental aspects, evaluating their impact on the environment factors, using the following criteria:

F – frequency of occurrence;

G – severity of effects (evaluated by quality indices of environment).

The reference points established for each criterion is presented in table 1.

Any modification of the information contained in documents that led to the identification of environmental aspects can lead to changes in the lists of environmental aspects / significant environmental aspects, their updated respectively. Also there are treated all significant environmental aspects applying corrective or preventive actions.

The assessment list of significant environmental aspects (SEA) is presented in table 2.

Through keeping records of the different waste streams, a customer can see the results of their efforts in becoming more environmentally friendly, and a more efficient business.

### 3 SWOT Analysis

To justify the implementation of a waste management it was developed a SWOT analysis and it consists of the following:

a) Strengths

- Elimination through a complete range of services, sorting, temporary storage, transport, according to environmental regulations;
- Development of new services through optimization of environmental management in accordance with applicable legislation;
- Existing of infrastructure in order to implement a sustainable management.

**Table 2. The evaluation grid of environmental aspects**

CRITERION	IMPACT		Impact evaluation (P)
FREQUENCY -F-	Accidentally (max one time /year)		2
	rarely (1 - 12 times/year)		4
	Very often, permanently (more than 12 times/year)		6
SEVERITY OF EFFECTS -G-	Are not regulations by legal provisions		1
	Are regulations by legal provisions	The monitor indicators not overcome the maximal admitted limits	3
		The monitor indicators overcome the maximal admitted limits	6
$P = F \times G$ ; $P > 12 \Rightarrow$ SEA			

**Table 2. The list of significant environmental aspects**

Environmental aspects	SEA score	Corrective actions	Preventive actions	SEA score after corrective actions implementation
Waste management	12	Placing a greater number of waste containers, recipients and waste bins	Checking and monitoring	6
Plastic waste	12	Implementation of applicable regulations	Recruitment of specialized company	6
Metallic waste	18	Implementation of applicable regulations	Recruitment of specialized company	12
Management of hazardous waste	24	Treatment / disposal of hazardous waste Acquisition of recovery agents for hazardous waste.	Analysis and monitoring of treatment process of hazardous waste	6
Management of industrial waste	12	Collection and disposal of industrial waste	Informing the staff on their waste management	6
Pollution of soil and surface water	24	Immediate collection of waste and treat the affected area	Control and verification in waste storage areas	6
noise pollution	18	Instructions for manipulate and compliance with operating parameters of the equipment	Periodical control of noise pollution	6
Air pollution	36	Interruption of process and treatment of cause	Often control of process progress	6
Environmental urbanization	18	Rearranging of waste collection sites in areas with easy access	Project analysis and networks in use	6
Fire	24	Compliance with operating parameters	Periodically check	12

## b) Weaknesses

- Expenses for environmental protection;
- Influence of legislative rules on recycling technologies and environment protection;
- Unqualified employers or inadequately trained, which can lead to poor waste management.

## c) Opportunities

- Access structural funds towards improving the environmental management;
- Partnership opportunities with the regional center for the ecologically treatment and storage of organic waste;
- Activities to promote and exchange of experience.

## d) Threats

- Competition is one of the threatening factors;
- Insufficient funds;
- Instability of current legislation in the field of waste management.

Continuous improvement requires:

- Improvement of environmental management system;
- Implementation of efficient technologies and work procedures;
- Continuous specialization (training) of employers and ensure its competence to control the processes into organization.

Improvement measures according to activities and environmental aspect are:

- Solutions adapted for managing the hazardous waste to their recycling in order to improve the environmental quality.
- Sustainable use of natural resources taking into account the carrying capacity of ecosystems.

## 4 Conclusions

In conclusion, waste management is a science that addresses the logistics, environmental impact, social responsibility, and cost of an organizations waste disposal. It is a detailed process that involves human resources, vehicles, government bodies, and natural resources [11].

The main objective of implementing an environmental management system is to reduce the impact on the environment of activities, products and services of organization. The most important are increasing profits by optimizing the use of resources (raw materials, energy), by improving waste management and reduce costs of any environmental incidents.

Areas where improvements should be implemented can be readily identified by the principle: if you do not measure, you cannot control, so you cannot improve. Managers can decide what improvement measures are necessary. Establishing the new objectives, providing the necessary resources, the development process, its outcome measurement and comparison of results with the initial objectives is a common practice in the application of what is called continuous improvement.

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