

**Identify and process waste**

 **US No: 9909 Level 2, Credits 4**

**LEARNER MANUAL**

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| --- | --- |
| Learner’s name |  |
| Facilitator’s name |  |
| Starting date  |  |

Hi there!

Welcome to a learning experience that will give you all you need to know how **to identifying and processing waste generated during production process**

Most of the activities are practical. Your facilitator will demonstrate and explain how to do certain things and then you will practice them. We hope you will enjoy this!

We have included some new words to learn so that you can improve your vocabulary. If you are not sure about the meaning of a word or how to say it, ask your facilitator.

We hope that when you have learnt these skills you will share them with others and take them from the workplace into your life

Have fun!



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**1. Introduction to your workbook**

This book belongs to you!

It is for you to work with and write in so that you can use the information at a later stage. This workbook contains a lot of detail and ideas to help you learn. Your facilitator will be available to guide you during the learning process. You will be expected to complete the activities in the workbook to show your understanding.

You will learn more by:

* Asking questions
* Participating in group discussions
* Reading additional material
* Completing the assignments
* Doing homework activities

**Remember - this book is to help you succeed!**

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**2. Unit Standard Learning Outcomes**

**Purpose**

To impart understanding, skills, knowledge and values of identifying and processing waste generated during production process found in a residential, commercial, industrial or institutional environment.

**Learners credited with this unit standard are able to:**

* Demonstrate an understanding of waste and waste handling methods
* Identify and separate waste
* Process waste

**Learning assumed to be in place**

It is assumed that learners are competent in:

* Communication at ABET Level 3
* The Unit standards:
	+ Understand basic cleaning principles (Level 1)
	+ Use chemicals in the cleaning services environment (Level 1)

**3. Critical Cross-filed Outcomes**

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| **NB This list contains all Critical Cross-field Outcomes identified by the South African Qualifications Authority.** |

**The complete list of Critical Cross-field Outcomes is:**

1. Identify and solve problems in which response displays that responsible decisions, using critical and creative thinking, have been made.
2. Collect evaluate organize and critically evaluate information.
3. Work effectively with others as a member of a team, group, organization or community.
4. Organize and manage oneself and one’s activities responsibly and effectively.
5. Communicate effectively by using mathematical and/or language skills in the modes of oral and/or written presentation.
6. Use science and technology effectively and critically, showing responsibility towards the environment and health of others.
7. Demonstrate an understanding of the world as a set of related systems by recognizing that problem solving contexts do not exist in isolation.
8. Contribute to the full personal development of each learner and the social and economic development of the society at large by:
9. Participating as a responsible citizen in the life of local, national and global communities.
10. Being culturally and aesthetically sensitive across a range of social contexts.

**4. What I must know**

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| **I must know the . . . . .** | **SO** | **AC** | **CCFO** |
| Methods of separating and processing water, effluent, waste, solids and gas | 2 & 4 | 1 & 2 |  |
| Relevant environmental and safety legislation | 1 | 1 | 6 |
| Impact of hazardous waste on the environment | 1 | 2 | 6 |
| Indicators of environmental pollution | 5 | 1 & 2 | 6 |
| Relationship of environment systems (environment, workplace and customer | 1 | 2 |  |
| Characteristics and properties of:• Hazardous waste• Effluent• Pollution | 1 | 2 |  |
| Purpose of recycling | 2 | 1 |  |
| Principles related to the processing and disposal of waste | 3 | 1 & 2 |  |
| Problems related to waste disposal | 6 | 1 & 2 | 1 |

**SO -** Specific Outcome

**AC -** Assessment Criterion

**CCFO -** Critical Cross-field Outcomes



**5. What I must be able to do**

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| **I must be able to . . . . .** | **SO** | **AC** | **CCFO** |
| Separate and process hazardous waste | 2 | 1 | 4 |
| Report environmentally damaging practices | 2, 3 &4 | 2 | 5 |
| Separate, process and dispose of waste | 3 | 1 | 6 |
| Work safely with due care for self, fellow workers, equipment, materials and the environment | 4 | 1 | 6 |
| Recognise and report environmentally damaging practices | 5 | 1 & 2 | 5 |

**SO -** Specific Outcome

**AC -** Assessment Criterion

**CCFO -** Critical Cross-field Outcomes



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| **MODULE 1: Demonstrate an understanding of waste and the impact on the environment** |

**The Natural Cycle**

**Nature recycles all its waste.**

When a leaf falls to the ground, it rots and becomes part of the soil which in turn feeds plants. The same thing happens to animals when they die. All things that die are broken down into nutrients, which feed new living things. The natural world is one big cycle.

**What can we learn from nature?**

Nature teaches us to recycle and re-use. Humans make use of things then discard them as waste creating pollution along the way. Anything that cannot be taken back by nature is called WASTE. Landfills or tips where the waste is deposited are getting bigger and bigger as more and more people throw away litter and dirt.

In order to protect our environment, we need to look at waste with new eyes and protect our rivers, seas, and soil

**“Waste is rubbish or materials that are not needed and are economically unusable without further processing. “**

**There are 4 types of waste:**

1. Solid

2. Sludge

3. Liquid

4. Gas

**Everything is dependent on everything else**

**Let’s talk about the environment around us . . . . .**

**AIR**

All living things need air

* we breathe in air (oxygen)
* plants breathe in air through their leaves
* animals need air to breathe

**WATER**

What do we use water for?

* **In the home**

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* **At work**

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**GROUND / LAND**

* Plants need soil to grow
* Water from rain flows through the soil to our rivers and dams
* We cultivate crops in soil - without crops we will have no food for our animals or grain for our bread.

**The Bill of Rights**

The most pertinent fundamental right in the context of integrated pollution and waste management is the Environmental Right, which provides that:

***"Everyone has the right***

1. to an environment that is not harmful to their health or well-being; and
2. to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures -
3. preventative conservation; and
4. secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social pollution and ecological degradation;
5. Promote development".

This section of the Bill of Rights guarantees the people of South Africa the right to an environment not detrimental to human health or well-being, and specifically imposes a duty on the state to promulgate legislation and take other steps to ensure that the right is upheld and that, among other things, pollution and ecological degradation is prevented

**Take the appropriate steps to limit pollution / waste at the workplace.**

Housekeeping practices, which are good for the environment need to be implemented. These could include:

* Separate waste
* Re-use waste items e.g. plastic containers can be recycled
* Clean up spillages
* Report and deal with environmental hazards
* Store chemicals / materials correctly and safely
* Observe safe work practices
* Pick up waste (waste includes cigarette butts)

**The impact of pollution / waste on the environment**

Pollution poisons the environment, negatively affecting all life and the eco-system in general. Pollution can be as the wrong substance in the wrong place in the wrong quantities at the wrong time.

**How does pollution affect our health?**

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**POLLUTION**

Pollution is the contamination of the environment by man-made substances or energy that have bad effects on living or non-living things.

This contamination of air, water, or soil materials interferes with

* human health,
* the quality of life, or
* the natural functioning of ecosystems.

This implies that harm is caused to the environment, and if the same substance is present at levels too low to cause harm, then it can be considered as CONTAMINATION. Many substances that can be pollutants also occur naturally, in which case they are not classified as pollution. However, other pollutants result entirely from human activity.

**TYPES OF POLLUTION**

**Air Pollution** is dirty air. What causes air pollution?

* Generation of power – coal is burnt in the power stations to generate power – for electricity. RESULT: SMOKE = POLLUTION
* Motor vehicles – the burning of any fuel gives off smoke causing pollution – smog
* Industry – factories give off smog and pollution as by-products of production.
* People burning coal and wood for heat and cooking.
* Veld fires.
* Aerosols containing CFC’s damage the ozone layer causing global warning of the greenhouse effect

**Remember: Air pollution damages the atmosphere – ozone layer. Air pollution can affect my health**

**Water Pollution**, contamination of water by foreign matter such as micro-organisms, chemicals, industrial or other wastes, or sewage. Such matter deteriorates the quality of the water and makes it unfit for its intended uses.

**Soil Pollution** is caused by:

* Soil is polluted by dumping (landfills) and informal dumping.
* Soil is polluted by drains from factories
* Soil is polluted by pesticides
* Erosion destroys soil (erosion is caused by bad farming methods and bad drainage).

**Soil erosion and pollution makes it hard to grow crops.**

**Noise Pollution** affects our living and working environment. Noise is unwanted sound.

It may be annoying; it may interfere with speech communication, leisure, or relaxation. At very high levels, which may occur at work or during certain noisy leisure activities, may result in loss of hearing.

We wear earplugs in very noisy environments to protect our hearing

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| **MODULE 2** **Identify and separate waste** |

**WHY DO WE NEED TO SEPARATE WASTE?**

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The waste pyramid is a tool used mainly as a diagram to compare the volumes of different categories of waste in relation to each other.

**WASTE PYRAMID**

A waste pyramid is split into separate levels, with each level representing a category of waste, the categories are:

* Waste that must be avoided
* Waste that can be reduced
* Waste that can be reused
* Waste that can be recycled
* Waste that must be disposed of.

**Before you start handling waste, you must . . . . .**

**CHOOSE PERSONAL PROTECTIVE EQUIPMENT OR PPE.**

It is very important to note that before you handle waste in any form, that you are protected. That is your constitutional right. Dirt and bacteria could affect your health. Poisonous gasses could kill you.

That is why it is very important to wear PPE or PERSONAL PROTECTIVE EQUIPMENT.

**PPE consists of:**

* Overalls
* Safety boots/shoes
* Mask
* Leather apron
* Gloves
* Goggles (if necessary)
* Hard hat
* Breathing apparatus (if necessary)

Tell your facilitator why you should wear the protective clothing.

Remember your worksite procedure and the waste you will be handling. Wear protective clothing when working with Hazardous waste

**Waste is also known as either:**

* **Hazardous waste** - has the potential to affect the health of those who come into contact with it, and negatively affect the environment, in general.
* **Non-hazardous waste** - is undesirable but does not present an immediate health threat.

**Waste is also either:**

* **Biodegradable** - can be broken down by micro-organisms e.g. vegetable peelings
* Non- biodegradable – cannot be broken down naturally

**The categories of waste are:**

* **Recyclable**….means you can use certain types of waste to manufacture something new. Example: Plastic can be recycled and treated to make plastic furniture, cups and saucers, plastic knives and forks for the fast food industry.
* **Non-recyclable**… means that you cannot use this type of waste again, example would be polystyrene. Usable waste is waste that can be re-used, an example would be egg boxes, paper, cardboard that could be given to pre-schools to use as art activities for children.
* **Unusable waste**.is waste that cannot be re-used, examples would be medical waste, hypodermic needles.
* **Recoverable waste**…paper is recoverable waste, it can be recycled to make new paper.
* Non-recoverable waste…example would be household waste, toxic or poisonous waste. This cannot be re-used or recovered
* **Organic Waste**…This type of waste is biodegradable, an example of this would be potato, and vegetable peels. One can make compost for your plants from this.
* **Inorganic waste**…This type of waste cannot return to the soil, an example would be plastic bags.

**When working with waste you need to:**

1. Identify what type of waste it is. (Solids, liquids, gas.)
2. Categorize the waste into the different types. (Glass, tin, paper.)
3. Separate the waste. Separate glass from tin, white paper from newspaper etc.
4. Store the waste into the correct bin. Paper will be stored in a bin marked “paper.”

**Separate waste into basic groups of waste.**

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| **RECYCLABLE** | **RE-USABLE** | **COMPAST** | **HAZARDOUS** |
| GlassPaperTinPlastic | WoodProduction parts | Food wasteGarden refuse | BatteriesAerosol cansFlorescent tubesOilSolvents |

Separate the waste according to your worksite procedures.

**Handling waste**

**HAZARDOUS WASTE** must be placed in containers that can be sealed, with clear labelling specifying the type of waste that is in the container.

**NONE HAZARDOUS WASTE** does not need to be in sealed identifiable containers

**Handling hazardous waste**

* Use the correct PPE
* Use the correct equipment
* Abide by task performance requirements and procedures
* Comply with any legal instruction given by your supervisor pertaining to responsible and compliant handling of waste material.
* Report hazardous waste spills to the designated person according to the worksite procedure
* Check hazardous waste containers are sealed correctly.
* Ensure hazardous waste containers are identifiable and clearly labelled
* Waste and hazardous waste are safely stored in designated areas.

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| **MODULE 3** **Process and dispose waste** |

**The majority of rubbish generated is**

* Paper
* packaging materials,
* discarded products and produce,

Once disposed of, these materials enter a waste stream, normally managed by the municipality. Some of the waste may be recycled but most will end up in landfills.

**Landfills can be dangerous to the community because . . . .**

* Ground water can become polluted.
* The community can be exposed to toxic or bio hazardous waste
* Landfills could give off bad odours

**Decomposing different kinds of waste**

* Certain types of waste are bio degradable such as paper and other organic based products these materials will decompose over time.
* Other materials such as plastic and rubber do not break down and may be burned or buried in landfills.

**REMEMBER** - it is very important to wear **PPE** or **PERSONAL PROTECTIVE EQUIPMENT**.

Steps to follow when handling and sorting waste

Step: 1: Wear PPE (Personal Protective Equipment)

Step 2: Sort the waste according to worksite procedure

Step 3: Compact the waste, or make it smaller and easier to handle

Step 4: Bale the waste

Certain waste can be sold to recycling companies. This is why it is important to handle and sort the waste correctly on site.

**Ways to handle waste, which will affect the value, received for it:**

* Waste should be separated at point of collection. Labelled containers/bins can be used for storage of the specific type of waste e.g. paper and cardboard. (This saves time and time is money).
* Waste should not be mixed and allowed to get wet.
* Recoverable waste should be kept dry.
* Bags containing waste should be secure at all times to ensure that waste does not fall out.
* A compactor machine can be used to flatten cardboard making it easier to handle and transport.
* Bales of waste need to be weighed and checked and recorded
* Less storage space is required because the skip or rubbish bin can hold more as a result of the cardboard being flattened.
* The same applies to tin and cans. The bailing machine compacts (or squashes) the cans into batches making it easier to transport and store.

**Effective waste management creates:**

* Labour cost saving
* Improved productivity
* Reduced disposal costs
* Additional revenue/money generated through the sale of waste

**CRITERIA FOR WASTE DISPOSABLE AREAS**

* Gates should be closed
* Locks should be fitted
* Waste containers should have lids
* Waste containers should be labelled