

# Waste and Chemicals Management



*Guidelines for the Hospitality Industry*





# Waste Avoidance, Re-use and Recycling towards a plan for ZERO WASTE to Landfill

## Introduction:

Across the world, unsustainable linear consumption patterns result in the majority of our extracted and refined resources being used once, and then discarded in landfill sites. Some predictions estimate a five-fold increase in global waste generation above 2005 levels by 2025.

The Zero Waste Principle seeks to develop closed resource loops through considered design and use of consumer goods, first reducing the amount of waste produced, then reclaiming, recycling and composting the remainder. If all products were designed to be re-used, recycled, composted or used as clean, renewable energy, it would become possible to eliminate the concept of waste completely.

South Africa is facing now severe landfill airspace crises in all metropolises. Provinces such as the Western Cape have an estimated 5 years of cumulative airspace left.

## *Major benefits of waste avoidance, reuse and recycling:*

There are several good reasons why minimising waste should be an important priority for hotels:

- To protect our environment and ease the pressure on our natural resources
- To significantly reduce purchasing and disposal costs
- To meet customers' expectations that the hotel is caring for the environment in a practical manner
- To contribute to a cleaner and more pleasant hotel environment for guests and staff.
- Practice waste avoidance to decrease resource consumption, save on purchase costs and preserve remaining landfill airspace
- By reusing an item it can be kept out of the waste stream all together for much longer
- Recycling of waste refers to the separation at source of recyclable materials from the general waste stream (waste separation at source is proposed, as the quality of recyclable materials is higher when separated there and not when mixed with other rubbish). Recovered materials which is then recycled re-enters the material cycle in an altered form often as part of a new product with recycled contents. Recycling reduces the amount of waste that needs to be disposed at landfills.

- In addition, recycling through source recovery has the potential for job creation and is a viable alternative to informal salvaging at landfills, which is undesirable due to the problems of health and safety associated with salvaging

### *Typical Environmental Savings:*

Less waste and less toxic waste gets landfilled.

If composting or wormfarming of organic waste is practiced the formation of methane gas (which is 21 times more potent in creating climate change than CO<sub>2</sub>) is prevented.

Used products and packaging waste are repositories of spent energy and material resources. A normal household can save 550 kgs of Co<sub>2</sub> it reduces its waste (mostly packaging) by 10% and another 1100 kg CO<sub>2</sub> /per year if it manages to recycle half of it.

### *Capital Costs:*

It depends on the specific intervention but in many cases absolutely none. Many financial saving opportunities linked to waste avoidance, reuse and recycling are linked to simple behavioral changes and easy adjustments of waste management service provider contract conditions (see also below for more detail) rather than technical changes or retrofits and do therefore mostly not require any capital outlay.

### *Typical Payback Period:*

can not be specified and depends on case to case intervention as given in the examples below:

#### **Possible Financial Savings Examples Waste Avoidance:**

By setting printers and copy machines to double sided printing a total of 50% of paper could be saved. With current procurement prices of around R 40/ream this could mean that the same amount of paper procured could last up to four times longer.

Equipping lavatories with electric hand dryers rather than traditional once-off paper tissue dispensers or re-usable towels would reduce procurement cost for those wasteful throw-away items to ZERO

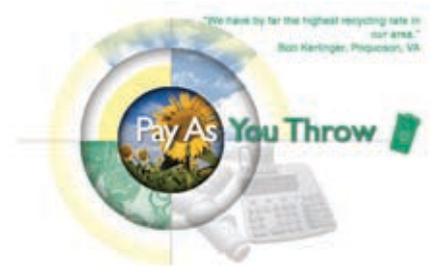


### Possible Financial Savings through Reuse and Recovering for Recycling:

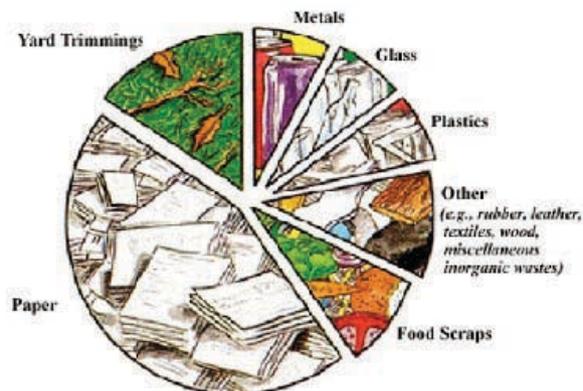
If an establishment insists on a "Pay as You Throw" contract with their waste collection and removal service that means they would only pay for what they really throw away and what subsequently needs to go to landfill.



Recovering 50% of waste for recycling and/or composting/ wormfarming and keeping it out of the waste stream would mean a 50% reduced monthly waste bill with such an arrangement.



In many cases waste contractors offer now either onsite or offsite recyclable recovery services for business clients such as hotels resulting in attractive rebates back to the hotels from the sales made thereof. Savings would then be related to the amount and type of recyclables sold to the final recycling and processing facilities which is typically a percentage of what the waste contractor (being the middle man) receives.



### *Did you know?*

In 1998 (latest officially available statistics) the average amount of waste generated per person per day in South Africa is estimated to be a minimum of 1 kg /day. However in economic powerhouse provinces such as the Western Cape and Gauteng at least 2.1-2.4 kg of waste per resident per day are generated (stats from the 1998 DWAF evaluation)

With recycling and composting of all of our recyclable and organic waste, as much as 80% of our total waste generated could be reused and recycled and does not need to be thrown away at landfill sites.

- Recycling 125 aluminium cans saves enough energy to power one home for 1 day.
- Recycling one glass bottle saves enough electricity to light a 100-watt bulb for 4 hours.
- More than 5,700 Kilojoules of energy are conserved for every pound of steel recycled.
- One ton of recycled paper saves 17 trees

The waste we put out in refuse bins and skips each week is really just the tip of the iceberg. For every product used such as paper, computers, packaged foods or chemicals substantial waste has been generated in the making of those products. It is estimated that as much as 90% of the materials used in the manufacture of a product become waste almost immediately.

# Establishment has a linen and towel reuse policy for long-term guests to reduce laundry load and resulting chemical usage:

*Place a door hanger in the room asking guests to tick if they want to reuse or change their towels and linens.*

## Introduction:

South Africa is extraordinarily rich in natural resources - except for water. Water is a vital, but scarce resource and is distributed unevenly in time (frequent droughts alternate with periods of good rainfall) and space (the eastern half of the country is markedly wetter than the western half). Increasing demand for water, and decreasing water quality, make careful water management a priority in our country (<http://www.gpg.gov.za/about/index.html>)

## Major benefits:

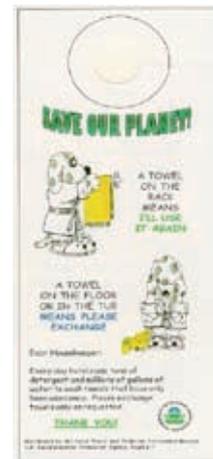
- Save water and energy used in washing and ironing towels and linens
- Reduction in chemical usage
- Reduction in cost of chemicals and water
- Reduction in cost of cleaning towels and linens

## Typical Environmental Savings:

Promotes awareness among guests and reduce amount of chemicals released into the environment

## Capital Costs:

None



*Doorhanger*



*A towel hanging off a bathtub*

### *Typical Payback Period:*

Immediate (savings on cost of dry cleaning linens and towels)

### *Did you know?*

- South Africa is a semi-arid country with only 8.6% of rainfall available as surface water. This places South Africa at one of the lowest conversion ratios of rainfall to surface water capture in the world. The country receives an average rainfall of 497mm which is significantly below the world average of 860mm (SOESA, 2005)
- According to commercial laundry equipment manufacturers, institutional washing machines use about 22 litres per kg of linen laundered. Industry estimates linen use at 4 to 6 kg per day per double occupancy room, depending on type of lodging and other factors, such as proximity to the beach. Foregoing daily fresh towels and bed linens, therefore, can result in saving as much as 135 litres of water per room per day.

### *Read more:*

[www.epa.gov/Region7/p2/p2hotelcards.htm](http://www.epa.gov/Region7/p2/p2hotelcards.htm)

# Give preference to water jugs filled with tap water over single-serving plastic water bottles

*Serve guests drinking water in bulk glass jugs*

## **Introduction:**

South Africans consumed 190 million litres of bottled water in 2007. Scientists argue that although bottled water is a healthy alternative to fizzy, sugar-loaded cool drinks, it is not better than regular tap water. Our local municipalities spend millions every year to ensure that our tap water can be consumed for drinking purposes and is of the highest quality. In some cases, bottled water is produced by utilizing normal municipal tap water and putting it through a basic filtering purification and sometimes mineral replacement/enrichment process. This is then termed “prepared water” and many consumers mistakenly believe this water is from natural or spring sources.

## *Major benefits of using bulk water dispensers and water jugs:*

- Conserve oil and energy used in the production of single use plastic bottles
- Save fuel for transporting (often imported) bottled water
- Prevent the formation of bulky plastic bottle waste
- Prevent the severe litter caused by single-serve, virtually valueless (since non-deposit) plastic bottles
- Prevent communities in the developing world from being controlled by water bottling companies. (Some communities, where these bottling plants are situated, are prohibited by law from collecting any water ( even rain water) for their own consumption, suffer from water scarcity as a result of groundwater exploitation and are often actually forced to buy their own water back as “bottled water”).

## *Typical Environmental Savings:*

Protect the environment by reducing fuel emissions in the manufacturing and transporting of the water bottles and reduce the resulting wastes dramatically. The best environmental choice is to serve tap water in jugs so, if possible, even do away with bulk water dispensers as they are also associated with unnecessary costs and waste.

### Capital Costs:

Bottled water costs up to 500 times more than tap water provided by the municipality.

### Typical Payback Period:

Immediate

### Did you know?

Most plastics are made from petrochemical feedstock derived from oil, natural gas and coal. In South Africa the gas comes from coal.

Plastic water bottles can take 1000 years to biodegrade

The municipal tap water quality in Cape Town is one of the best world-wide

Global consumption of bottled water has been growing over the past five years despite the fact that in many places, including Europe and the US, there are more regulations governing the quality of tap water than bottled water

The Earth Policy Institute estimates that making bottles to meet the US demand for bottled water requires more than 15 million barrels of oil annually, enough to fuel 100,000 cars for a year.

Transport and disposal of the bottles adds to the resources used, and water extraction – which is concentrated in communities where bottling plants are located – adds to the strains bottled water puts on our ecosystem.

The mayors of San Francisco, California and Salt Lake City, Utah signed a bill in 2007 prohibiting city offices from buying and using bottled water in government buildings. In New York City and Los Angeles, California, ads promote tap water as a better-tasting and healthier choice than bottled H<sub>2</sub>O and in response, restaurants have started to offer their customers water in jugs at the table with growing success.

As a result an increasing number of people rediscover that they have been brain-washed by the water bottling industry in the past and now enjoy the high quality of their tap water, while preventing waste, preserving oil resources and saving money.

### Read more at:

<http://www.container-recycling.org>

<http://www.timeforkids.com/TFK/kids/wr/article/0,28391,1658091,00.html>

[http://www.thisislondon.co.uk/standard/article-23441557\\_details/My+customers+say+bottle+ban+is+best+thing+I've+ever+done/article.do](http://www.thisislondon.co.uk/standard/article-23441557_details/My+customers+say+bottle+ban+is+best+thing+I've+ever+done/article.do)



UK restaurant water on tap campaign



Hot and cold bulk water dispensers (only if serving municipal tap water is really not an option healthwise)

# Control of dosing and diluting and use of chemicals (quantity optimisation) by a suitable staff member

*Ensure that a well trained staff member controls dosing, diluting and use of chemicals.*

## Introduction:

Chemicals are often delivered in bulk and as concentrates. They perform most effectively when properly diluted and applied. Disinfectants need to be diluted correctly for proper germ killing performance while not placing an unnecessary chemical load burden on the receiving environment. Overdosing of chemicals is wasteful, and underdosing can lead to contamination and an ineffective cleaning operation.

Hence, a well trained cleaning staff member has to be identified for the ongoing dilution and proper administration of all cleaning chemicals used. Such a person needs to know how the strength or concentration of each of the chemicals is properly prepared. If, for example, a 1:10 dilution rate is called for, this means that 1 part of the concentrate needs to be mixed with 9 parts of water (1+9). In other words, should a finally diluted chemical volume of 5 litres be required, a total of 500 ml of concentrate would have to be mixed with 4.5 litres of water.

After the dilution process, containers should be well labeled with the chemical name, solution strength (percentage or %), active chemical ingredients and date of preparation. Dosing equipment, such as dispenser measuring cups, further assist in not using expensive and often environmentally harmful chemicals unnecessarily.

## *Major benefits of proper dilution and controlling chemical dosage:*

- Superior performance and most effective cleaning properties
- Reducing any unnecessary environmental burden of the chemicals on the receiving environment
- Less risk of skin burns or other health impacts when handling properly diluted chemicals with corrosive, acidic or caustic properties
- Financial savings by using less chemicals
- Reduction in damaged surfaces and fabrics

### Typical Environmental Savings:

Protect the receiving environment from unnecessary harm

### Capital Costs:

About 20 Rand to buy an empty chemical dispenser bottle or measuring cup. Some chemicals (e.g. as typically used in the kitchen for dishwashing and cleaning) are provided by the supplier with automatic dilution equipment for free.

### Typical Payback Period:

Immediate

### Did you know?

Inappropriate dosage of chemicals can kill people, animals and plants

Phosphates (which contain phosphorus) are used in laundry detergents to soften the water and help keep extracted dirt from being redeposited onto your washing. In the environment, however, high levels of phosphorus can cause eutrophication — excessive growth of blue-green algae in inland waterways, which can clog rivers and restrict light and oxygen availability to other plant and animal life. It can also make the water toxic to humans and aquatic life.



Automatic dilution system as provided by chemical supplier



Cd instructing staff on correct dosage



Manual dispenser unit and chemical measuring cup

# Dry Steam (Steam Vapor) Cleaning technology to clean and disinfect suitable surfaces and areas

*Using chemical free and water wise dry steam technology*

## Introduction:

Dry steam or steam vapour cleaning technology is a variation of conventional effluent producing steam cleaning technology. Such a commercial steam cleaning machine produces high temperature, high pressure steam, known as dry vapour steam. "Dry Vapour" refers to the moisture content of the steam (only 5%) heated up to about 280- 300 °C which, alone or sometimes coupled with very few cleaning products becomes a significantly more environmentally sound cleaning tool that also greatly conserves water.

With steam vapour cleaning, the only waste stream that is produced is from the substance being removed (e.g., oil, dirt and grease). For dry vapour cleaners, water consumption in an average 8-hour work environment ranges from 4.5 litre (small size) to 13 litre (medium size) to 22 l (large size). Worker safety is improved because only vapour exits the nozzle. The vapour does not contain water bubbles, thus workers will not be burnt at close range.

## How does it work?

The equipment is heated to a high enough temperature and water introduced changes to Dry Steam Vapour, which becomes a tremendous cleaning tool. It does so without any chemicals and very little moisture, which allows the surface to dry almost immediately, removing dirt, degreasing and killing bacteria and other micro-organisms instantly. The equipment can be used for the cleaning of any smooth surfaces in kitchens (ovens, floors, food preparation and work areas) and guestrooms (toilets, showers and basins). This technology is generally not used for cleaning large carpet areas but the vapour steam is ideal for localised chewing gum, stain and spot removal from carpets and upholstery.

Steam cleaning is not recommended for any equipment, component, or material that is temperature or moisture sensitive as water from the steam can penetrate and/or damage joints, seals, and bonded areas.



*Dry steam cleaning equipment*

### *Major benefits of dry steam cleaning technology:*

- Eliminates or reduces allergens
- Conserves water
- Sanitises cleaning surfaces and kills bacteria
- Eliminates cleaning chemicals and the release of toxins into the environment
- Saves the costs for cleaning chemicals replaced by this technology
- Reduces labour and cleaning times significantly

### *Typical Environmental Savings:*

100% savings from disuse of chemicals.

### *Capital Costs:*

If purchased between \$ 1500-5000 for a commercial unit

None (if service using such equipment is included in cleaning contract)

### *Typical Payback Period:*

None (if service is included in cleaning service provider's contract).

The estimated payback (as calculated by the US Navy based on utilizing a dry steam cleaning model for \$ 5000) is less than a year (see also website link below) but this can only be used as an indication as labour costs, electricity costs, and water costs differ.

### *Did you know?*

Dry Steam vapour kills bed bugs, dust mites, fleas and any insect eggs and larvae - a great relief for any skin or asthmatic allergy sufferers!

Find out more at:

[http://p2library.nfesc.navy.mil/P2\\_Opportunity\\_Handbook/8\\_I\\_6.html](http://p2library.nfesc.navy.mil/P2_Opportunity_Handbook/8_I_6.html)

<http://www.allbrands.com/products/abp03904-0086.html>



*Grout before*



*Grout after*

# Emergency Response Plan (ERP) in place addressing in detail the reaction to accidental spills or employee's exposure to hazardous materials

*Contract a chemical management specialist to draft an Emergency response plan for chemical usage in the establishment.*

## **Introduction:**

The key issues that will influence the effectiveness of an ERP are coordination issues, communication and information management issues, and training issues. Other physical factors are equipment performance and human error. It is clear that a reliable and effective warning system is not enough in isolation; therefore an integrated system of (a) warning system maintenance and enhancement, (b) education and response planning is necessary (Ian Galley et al, 2004).

## *Major benefits of an ERP:*

- Preparedness
- Ongoing environmental , health and safety training and alertness
- Health and Safety Risk Reduction
- Demonstrating responsibility for public health and environmental protection

## *Typical Environmental Savings:*

Protect the environment and human health from the impact of any harmful chemical spills or reactions

## *Capital Costs:*

Cost of drafting the ERP (varies from consultant to consultant) but might be done by the chemical supplier on request of the client

### Typical Payback Period:

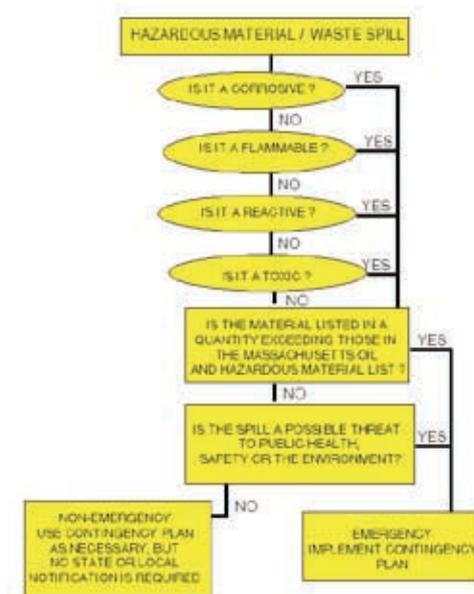
Immediate – 6months

### Did you know?

- Prevention is better than cure
- You may be exposed to a chemical in three ways:
  - Breathing in the chemical
  - Swallowing the chemical
  - Touching the chemical, or coming into contact with clothing or objects that have touched the chemical
- Chemical accidents often result from trying to improve the way a product works by adding one substance to another, not following directions for use of a product or by improper storage or disposal of a chemical. Avoid mixing common household chemical products. Some combinations of these products, such as ammonia and bleach, can create toxic gases.



Emergency response



Emergency response plan

Use certified “green chemicals” that are petro-chemical free and/or eco-labelled with and/or are proven to perform similarly to chemicals bearing an internationally accepted logo such as Green Seal, Blue Angel, The EU Flower, The Nordic Swan etc

*Cleaning service provider should provide you with a list of eco-labelled or proven green chemicals.*

#### **Introduction:**

Cleaning chemicals could be toxic in nature. Chemicals may be making us sick (for example, giving us cancer), affecting our brains (for example, making us forget things or making us restless), and affecting our hormones (for example, reducing men’s sperm count or causing babies to be born with physical problems). The World Health Organisation says that most cancers are caused by coming into contact with toxic chemicals in our environments (groundwork).

Even if you buy well-known brands from well-known shops it does not mean the products are safe. There are over 80,000 man-made chemicals in use today and only about 2% of these have been properly tested to see if they are safe for human use. But even some chemicals which have been tested and have been found to be harmful are still allowed to be added to our foods and other household products (groundwork).

Therefore, ensure that cleaning products used are eco-labelled because this implies that they have undergone rigorous testing and have, in fact, proven to be eco-friendly and void of chemicals harmful to human health and the environment. Explore locally produced natural alternatives such as green products (Citrofresh, Enchantrix, imported but readily available commercial strength certified green cleaners e.g. SimpleGreen) or research home-based recipes for yourself eg. varying ratios of vinegar, salt, baking soda and boiling water work very effectively and can replace most of the conventional chemicals.

### Major benefits of separate disposal of hazardous waste:

- Reduce health risk
- Reduce risk of groundwater, soil and air pollution
- Save money on chemicals - should you decide to make your own range

### Typical Environmental Savings:

Green chemicals are readily biodegradable, non-toxic to humans and the environment and ozone friendly.

### Capital Costs:

Competitive and, for the most part, directly comparable, especially when bought in concentrates that can be diluted according to the chemical strengths required.



Green Chemistry



Green Seal certified commercial cleaning range



### Typical Payback Period:

n/a

### *Did you know?*

- Cleaning chemicals in your hotel could be a ticking time bomb! Recent studies have revealed that most households/offices contain over 63 hazardous products containing hundreds of chemicals. These chemicals have the potential to harm or even kill you, your children and your pets if not used with caution.
- The Body Burden Study Senior Toxicologists at the Environmental Working Group, an NGO in Washington tested blood and urine samples of nine Americans for toxic chemicals found in cosmetics, household cleaning products and industrial pollution.

They looked for 210 chemicals (all developed in the last 50 years) , and found 167 chemicals in the people in our study. The average person had 91."

### *Be informed*

Visit [www.groundwork.org.za](http://www.groundwork.org.za) for a listing of common chemical pollutants and their health implications and do the "household toxic tour"

<http://www.nontoxic.com/nontoxic/askdoctor.html> for a non-toxic consumer guide listing DIY recipes for chemical alternatives

## Safe removal, treatment and disposal of hazardous waste such as fluorescent tubes, motor oils, batteries, chemical & paint product residues, cooking oil, electronic waste items etc through a specialized and authorized waste management service provider

*Require from your professional waste service provider to offer regular special hazardous waste collection services (and to provide you with proof of safe disposal of such wastes).*

### Introduction:

Hazardous waste can be defined as “waste which can, even in low concentrations, have significant adverse effects on public health and/ or the environment” (South African National Government). This is as a result of its inherent chemical and physical characteristics, such as toxic, ignitable, corrosive, carcinogenic and other hazardous properties.

The problem with commercially or domestically generated hazardous waste is that, in most of South Africa, it is simply being mixed with the general waste stream and is then disposed of on unsuitable general landfills that offer no special ground water protection. Chemicals, batteries, heavy metals (mercury, lead, cadmium), paints, pesticides, household cleaning agents, etc. are some of the hazardous wastes being disposed of on our general landfills. The Provincial government of South Africa comments that “The probability of the pollution of ground water as well as surface water is relatively high, if these wastes continue to be disposed of on the general landfills.” - which is why studies are currently under way in the Western Cape to develop a comprehensive collection and treatment plan for such hazardous wastes.

### *Major benefits of separate recovery, treatment and disposal of hazardous waste:*

- Treatment of hazardous waste can make it inert
- Reduced risk of groundwater and air pollution
- Recovery of certain items e.g. e-waste recovery reduces waste going to landfill
- Reduced risk of poisoning residents of informal communities who often live close to landfills and who salvage suitable recyclables and even food from the landfills



*Samples of hazardous waste generating products*

### *Typical Environmental Savings:*

Less toxic waste and less waste, in general, going to landfill

### *Capital Costs:*

Specialist fees if not included in the waste contract. To dispose of 1 m<sup>3</sup> of hazardous waste at the relevant landfill in Cape Town costs about R 130 whereas the same amount of general waste delivered to the landfill site costs about R 95. The price difference is therefore around R 45/metric ton at the landfill site gate



*Motor oil and paint cans get collected*

### *Typical Payback Period:*

No payback - this suggested intervention comes at an additional cost but it is the responsible thing to do in order to protect our environment and ultimately our own health

### *Did you know?*

South Africa produces approximately 350 000 tonnes of toxic waste annually (Pick 'n' Pay Envirofacts)

### *Be informed*

Visit [www.groundwork.org.za](http://www.groundwork.org.za) for a listing of common chemical pollutants and their health implications

## Provision of Newspapers on demand to guests:

*Place a door hanger in the rooms, informing guests request newspapers if required.*

### **Introduction:**

Newspapers are made from trees and are not always required by guests. To prevent wastage, it is more reasonable to ask guests to tick their preference as stated on the door hanger in the room.

### *Major benefits:*

- Reduce energy
- Reduce cost of newspapers
- Reduce chemicals
- Preserves forests

### *Typical Environmental Savings:*

Protect nature's fast disappearing trees and reduce wastage.

Reduce water, chemicals and energy used in producing newspapers

### *Capital Costs:*

none

### *Behavioural change:*

Circulate newspapers already used by guests especially when guests leave in the morning

### *Typical Payback Period:*

Immediate. To illustrate this point, if 20 guests do not require newspapers in a day, the hotel has already saved R200. In a month, this could be an average of R6000 (R200 x 30 days).

### *Did you know?*

Recycled paper saves trees, water and energy and reduces air pollution by 70%. One ton recycled paper preserves 17 trees (Fairest Cape Association)



# No use of pesticides containing organophosphates

*Ensure pesticides used in fumigation and other applications are free of organophosphates.*

## **Introduction:**

Organophosphate pesticides are a group of chemicals that are mainly used in agriculture. Exposure to organophosphates is broadly classified into two categories: occupational and environmental. Occupational exposure occurs among workers exposed to pesticides, pest control exterminators etc. Effects of organophosphates on human health are lymphoma, acute cholinergic signs, gastrointestinal upset, cancer in children, urination, sweating, muscle weakness, hypertension, spontaneous abortions, coma, nausea, headache, dizziness, blurred vision, abdominal pain, vomiting, and chest tightness.

## *Major benefits of organophosphates-free pesticides:*

- Reduce health risk for people and animals alike
- Reduce risk of groundwater, soil and air pollution

## *Typical Environmental Savings:*

Organophosphate-free pesticides preserve the environment while protecting crops and ornamental plants

## *Capital Costs:*

None

## *Typical Payback Period:*

Not applicable



*Organophosphates are banned in some countries*



*Organophosphates work by paralyzing muscles, and in large amounts they can kill humans and other species in the same way that they kill bugs. Over-the-counter South African insect control sprays might contain them as well*

### *Did you know?*

There are some 3 000 000 cases of acute pesticide poisonings, with 220 000 deaths annually. The majority of these incidents occur in developing countries, especially in Africa, Asia, and Central and South America (World Health Organization)

In the US, organophosphate pesticides containing diazinon and chlorpyrifos (also traded under Dursban) were widely used in the 1990s but were withdrawn from the market for home use in the early 2000s because of risks to children

Read more about the dangers of organophosphates:

<http://journals.aol.co.uk/bettineolive/Pesticidesinblood/entries/2007/02/08/organophosphate-pesticides---their-effect-on-the-human-body./659>

## Office paper reduction programme including reuse of paper, double sided copying, smaller fonts, email vs print out policy etc.

*Staff members should be sensitized to the need to conserve paper. Office paper has three major environmental impacts: methane emissions when it is land-filled, carbon-dioxide emissions from the energy needed to evaporate water in the manufacturing process and water pollution from the chemicals, including chlorine, used in manufacturing*

### **Introduction:**

Statistics have shown that paper use can be greatly reduced in hotels. To illustrate this point, the back of waste paper should be used for internal communication and all printers and photocopiers should be set to double sided. Furthermore, guests' confirmation and delivery confirmations etc. should be sent via email (if necessary with electronic signature) for verification instead of printing hardcopies. For large documents, the number of pages to print out can be greatly reduced by simply reducing the font size.

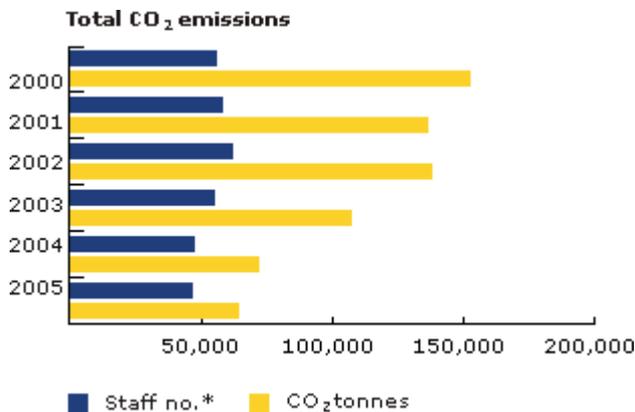
Recycling office paper is preferable to virgin production but is still not ideal. It uses half the energy, and produces between half and three quarters of the water and air pollution. Therefore, it is preferable to reduce the over-all paper consumption altogether

### *Major benefits:*

- Reduced ink used in printing
- Reduced paper purchase cost
- Reduced paper waste and possible reduced waste removal and treatment costs
- Reduced energy, water and chemicals used in paper production

### *Typical Environmental Savings:*

Conservation of natural resources, reduction of toxic paper production and ink waste



*Graph from Company Aviva showing the results of an inhouse paper reduction programme*

[www.aviva.com/csr06/index.asp?pageid=31](http://www.aviva.com/csr06/index.asp?pageid=31)

Commercial and residential paper waste accounts for the largest portion of waste currently being landfilled. Eliminating paper from waste would significantly pro-long the lives of current landfills.

Every recycled ton of paper saves approximately 17 trees, (which is then available for other uses), and approximately 462 gallons (1 gallon ~3.8 litre) of oil. Recycling paper also reduces the air and water pollution due to paper manufacturing.

*Read more at:*

<http://www.p2pays.org/ref/11/10131.htm>

### *Capital Costs:*

None (Ensure printers and photocopies are set to provide double-sided function during installation) and change user behaviour.

### *Typical Payback Period:*

Immediate. For each ream (500 sheets of paper) of A4 office paper reduction, about R 30-35 can be saved and this excludes the ink cartridge costs (if print out is prevented and documents are administered electronically instead). Set a current paper and printing ink consumption baseline now (paper used per employer per month) to see how much money you can save through a dedicated paper reduction program.

### *Did you know?*

Typical business offices generate about 1.5 pounds of waste paper per employee per day

## “Direct Return to Supplier” packaging waste agreement for suitable reusable and refillable (bulk container) items such as juice bottles and canisters, glass bottles, jam jars, cooking oil buckets but also product wrapping, delivery crates etc.:

### Introduction:

In South Africa, packaging is estimated to contribute some 12% of the household waste stream (PIKITUP Survey 2004). Single serve packages are some of the most wasteful items produced globally causing litter problems in every country and depleting both renewable and non-renewable resources unnecessarily.

Every effort must be made to replace virgin material manufactured single serve items with multiple use, recycled content containers that are refillable, reuse-able and ultimately returnable to their original suppliers for subsequent recycling when a new delivery of products is made.

By requesting a “return service for product waste from the original supplier the ultimate product waste responsibility gets shifted towards the initial waste generator – the manufacturer as the supplier will put pressure on him if he gets inconvenienced and financially burdened with having to dispose of YOUR valueless waste. The desired result would then be a complete product redesign that would accommodate a demand for take-back for recycling rather than wasteful disposal.

### Major benefits:

- Save cost of waste disposal
- Extend lifespan of landfills (only 5 yrs landfill space left in the Western Cape)
- Promote recycling and extended producer responsibility
- Promote more environmentally friendly product designs

### Typical Environmental Savings:

An average household can save 550 kgs of Co2 if they reduce waste (mostly packaging) by 10% and another 1100kg Co2/per year if they recycle half of it- WWF. Therefore, imagine what a hotel can do ?

### Capital Costs:

None because collection of packaging would be a criteria for selecting suppliers

### Typical Payback Period:

Immediate (savings on waste disposal) and storage space.

### Did you know?

In the Western Cape, enough waste is thrown away annually to fill a row of disposal trucks stretching from Cape Town to Gauteng – that is about 1 400 kilometres! (Fairest Cape Association, 4th edition).

The lifetime of much of our packaging waste exceeds 500 years and 2% -3% of all oil is used globally for packaging



*Bottles with deposit*



*Returnable  
crate Systems*



*Package and design products  
with the planet in mind*



# Sensible chemical storage with controlled access in a well ventilated room

*Ensure that chemicals are properly stored with controlled access in a well ventilated room. This activity can be carried out by the staff member responsible for chemical dosage and dilution.*

## **Introduction:**

Certain chemicals are toxic, corrosive, acidic or caustic in nature and should be stored in a secured room with restricted access due to their potentially harmful effects to humans and the environment when mismanaged.

## *Major benefits of sensible storage:*

- Spill prevention and containment
- Reduction in workers exposure to chemicals by inhalation and other absorption processes
- Fire, explosion risk reduction
- Lockable room means protection against theft

## *Typical Environmental Savings:*

Protect the environment from chemical accidents that can be caused when chemicals are leaking or forming toxic or explosive gases

## *Capital Costs:*

None specifically, all that is required is a lockable room with concrete or tiled flooring. Easily accessible shelves are required to safely store pre-sorted chemicals (according to their hazardous characteristics and potential), possibly some spill trays in case of leaking chemicals, and a window that can be left partly open (e.g through a latch) to provide continuous air circulation.

### *Typical Payback Period:*

Immediately as chemicals and other stored cleaning equipment and sundries are not pilfered as easily when there is restricted access.



*Safe chemical storage*



*Label on door*



*The less harmful chemicals used the better*

### *Did you know?*

Sensible storage of properly labeled and contained chemicals can go a long way to prevent fatal accidents as a result of incorrect handling.

Restricted and locked access to chemical supply room has proven to make a dramatic difference in the number of chemicals that get pilfered by staff. Hotels find that they have a 20-30% reduction in chemical costs.

## Implement a split bag / bin system throughout the hotel using one unit for mixed recyclables and one for remaining waste

*Request assistance for a “split bag system” from your waste service provider. Such source separation of any recyclables (including dry and clean paper, cardboard, plastics, glass, cans etc. as a mix) away from unusable, dirty and wet rubbish makes it much easier to recover and sort the unspoilt recyclables according to their waste types further down stream.*

### **Introduction:**

Recycling should be easy and convenient. The split bag system enables guests and staff members to separate valueless general waste easily from valuable mixed recyclables.

This system should ideally be implemented by having both a well-labeled twin bin lay-out in all guest rooms and public areas upstream, complemented by a similar repeated downstream sorting process by the cleaners when rooms are cleaned and bins are emptied and possibly in the basement (to recover any recyclables that were mistakenly placed into rubbish) before the waste (and source separated recyclables) is collected by the waste service provider.

### **Major benefits:**

- Extend Landfill space
- Earn income from recyclables and create job opportunities
- Reduces extraction rate of resources used to make recyclable packaging
- Education of guests and staff alike on the importance and easiness of recycling

### Typical Environmental Savings:

The multiplier effect of environmental education can not be over emphasized because staff members are likely to adopt recycling as a lifestyle and foreign guests will be pleased to see such services offered.

### Capital Costs:

None (Waste service provider to provide well labeled twin bins) as well as some public educational material on how to use them. If bins are directly purchased they are available at about R 100-150 (for the plastic model) at any retailer named "Bio Bin"



### Split bin models

<http://www.angelfire.com/dc2/biobin/products.htm>

### Typical Payback Period:

Immediate (Savings on recyclables)

### Did you know?

- Recycling 125 aluminium cans saves enough energy to power one home for 1 day.
- Recycling one glass bottle saves enough electricity to light a 100-watt bulb for 4 hours.
- More than 5,700 Kilojoules of energy are conserved for every pound of steel recycled.
- Producing one cellphone requires 75 kg of resources.
- A toothbrush requires 1.5 kg of resources – coal, oil and water – in its production.

# Procurement of an environmentally friendly manufactured paper product range to replace conventional paper stationary

*A new generation of environmentally friendly produced paper is now locally manufactured and locally available*

## **Introduction:**

In 2006, South Africans used over 2 million tons of paper and achieved a recovery rate of 44% (Fairest Cape Association). Most high-grade white paper initially recovered in the past was however down-cycled to become toilet paper and facial tissues in the absence of a local manufacturing process that could produce office paper with recycled contents. One out of 3 key South African paper manufacturer, namely "Sappi", eventually took up the challenge to meet a growing demand for environmentally friendly office paper and retrofitted its paper mill in Stanger (KZN) accordingly. Since 2006, they have been selling a brand named Typek Triple Green with the following attributes:

- Made with 30% post consumer waste
- Made with 20% post industrial waste
- Elemental Chlorine Free Bleaching Process
- Acid Free
- Wood fibres from well managed forests (Forest Stewardship Council Ecolabel)
- Locally produced

## *Major benefits:*

- Reduce energy
- Reduce freshwater consumption
- Reduce chemicals in manufacturing
- Reduce amount of trees required for paper manufacturing

- Reduced transport as recycled paper is made locally
- Less post –industrial waste going to landfill (e.g. industrial sugar cane waste gets used)
- Less post-consumer waste going to landfill (paper waste is one of the largest waste stream still ending up at landfills)

### *Typical Environmental Savings:*

Protect the environment and human health by reducing environmental pollution and slowing down extraction of resources and their consumption rates.

### *Capital Costs:*

Typically a ream (500 pages) of Typek Triple Green office paper would be about R 5 more expensive. There are, however, specials at times e.g. at CNA and MAKRO where the green paper is, in fact, cheaper than the conventional product which does not offer the green benefits of chlorine and acid free bleaching and recycled content.

### *Additional Behavioural Change:*

Where possible, use less paper as waste prevention is much more powerful for resource conservation than any recycling of existing waste.

### *Typical Payback Period:*

n/a

### *Did you know?.*

- To produce one ton of paper, 100 tons of water are used.
- Recycling paper uses 50% less water than when paper is made from virgin wood pulp.

### *Read more:*

<http://www.theinnovationhub.com/newsbits/vol5no7/news07.cfm>



*SAPPI TYPEK Triple Green Paper*

# Buy Food Products and Ingredients With The Following Attributes: Organic, Fair Trade, Anti-Animal Cruelty and Locally Produced

*Head chefs of hotel restaurants should ensure that an increasing percentage of food ingredients bought should come from sustainably harvested sources of organic products that are grown with the environment and respect of all creatures that live in it in mind.*

## Introduction:

The world today is moving from chemically produced food products to healthier organic choices and local retailers continue to expand their organic sections and selection of organically grown food on offer in direct response to this rapidly growing demand. Organic produce is much better for everybody's health than mass-produced plants as they are free of genetically modified organisms, harmful hormones, chemical residues (e.g from pesticides) and growth stimulants.

It is essential for the hospitality industry to support local farmers by purchasing food ingredients from farmer markets or by ordering organic food boxes. Furthermore, endeavor to buy fruit and vegetables that are in season vs imports because the less the food has traveled, the less transport miles and fuel is spent and the more nutritious and delicious and environmentally friendly it is.

Make your purchases non-exploitative to both humans (support fair-trade initiatives e.g. for typically imported products such as coffee, cocoa etc) and animals (free-range and ideally more vegetarian food choices altogether)

## Major benefits:

- Local is often less expensive
- More nutritious
- Reduced health risk
- Promotion of local industry, local product diversity and job creation

- Social injustice to humans and animals and selective mass production of genetically modified and often bio harmful plant monocultures can be overcome by consumer power and changing product demands

### *Typical Environmental Savings:*

Less bio-persistent chemicals (such as pesticides) accumulated along the entire food chain including by the final consumer - humans

Cleaner Water and Air

### *Capital Costs:*

Typically slightly more expensive as price more fairly reflects the real costs encountered in the production

### *Typical Payback Period:*

Immediate - not financially but definitely health-wise and by a much better taste plus the knowledge that the purchase supports the growth of our local agricultural economy.

### *Did you know?*

Organic products can increase your lifespan and reduce health cost!

To find out if a type of fish is an environmentally friendly choice, visit [www.wwf.org.za/sassi](http://www.wwf.org.za/sassi) or sms the name of the fish to 0794998795

Visit [www.go-organic.co.za](http://www.go-organic.co.za) to find out more about local suppliers



*Community garden*



*Organic fruits*



*Soil enriched with organic matter*

# Embark On A Vermiculture Project To Deal With Most Of Your Organic Kitchen Wastes

## Introduction:

Vermiculture literally means farming with earthworms. Vermicomposting describes the processing of organic material by earthworms (here in South Africa the Australian Redworm is used) and other soil organisms. While earthworms consume decomposing matter, most of their nutrition comes from bacteria and fungi that are involved in decomposition.

Earthworms excrete worm casts (vermicast) which contain large amounts of beneficial bacteria that continue to assist the decomposition process. In addition a black leachate (named worm tea) is created in the process from the water in the vegetable waste that is very rich in organic components and can therefore be used as an excellent organic fertilizer concentrate

## Major benefits:

- Reduces food waste at the landfills
- Reduces methane gas formation in landfill and therefore global warming
- Improves soil structure and aeration
- Fertiliser (worm 'tea') brewed from vermicast provides nutrients to plants
- Potential to make money from the sale of worms, the vermicast, and the worm tea

## Typical Environmental Savings:

Organic waste can be expected to reduce in volume by between 40% and 60% (once shredded), and a similar percentage in weight due to gradual loss of its initial moisture content which can be up to 90 %. Methane gas, which has a climate change potential 21 times higher than carbon dioxide, is not formed when food is processed by worms.



*Can o worms*



*Worm factory*

### Capital Costs:

#### Worm Factory

Cost:	Unit (without earthworms)	R600.00
	1000 earthworms (0.5kg)	R150.00 – R200.00

### Typical Payback Period:

6 months

Can-O-Worms<sup>®</sup> and Worm Factory<sup>®</sup> are the most popular and best rated domestic vermiculture systems available worldwide. Both products are exported from Australia to the USA, Canada, Europe, Japan and South Africa. They are distributed in South Africa by Full Cycle CC [www.fullcycle.co.za](http://www.fullcycle.co.za).



### The Process

The worm farms contain composting worms, which under ideal conditions are able to eat up to half their weight in organic waste each day. Worm Factory<sup>™</sup> and Can-O-Worms<sup>™</sup> are initially stocked with 1000 adult worms, which once established can double in numbers every 3 to 4 months. When fully operational system can house in the region of 18,000 composting worms, capable of eating up to 2-3kgs of organic waste daily.

Being a closed, odorless, hygienic system, the Can-O-Worms(tm) can be situated near the back door, on balconies or in the garden

What to compost: Newspapers, most kitchen waste, leaves and soft cuttings

What not to compost: cooked food, meat magazines and colour newsprint

### Did you know?

- Composting reduces household waste by 30% and helps feed the soil

## Waste gets removed by an authorized public or private service provider and relevant documentation with proof of proper waste disposal is available

### Introduction:

Waste collection, transport and disposal (and, with dwindling resources, increasingly also waste recovery for recycling) is big business in South Africa. A range of contractors varying from opportunity driven “fly-in-by-night” operators to highly professional and well established service providers offer their various waste management services.

The Duty of Care principle requires that any person who generates, transports, treats or disposes of waste must ensure that there is no unauthorized transfer or escape of waste from his control. Such a person must retain documentation describing both the waste and any related transactions. In this way, he retains responsibility for the waste generation or handling.

If, for financial reasons, an establishment chooses an unsavory, unaccountable, informal waste contractor, there is a high probability that such waste (paid for and destined for landfill) could, in fact, be illegally dumped. Should any environmental damage and/or public nuisance result from such practice, the respective municipality can request a full cost recovery for any clean-up or remedial action required which might have to come from the tourism establishment itself.

### *Major benefits of dealing with an established waste removal service provider:*

- Proof of safe disposal at an authorized landfill site by obtaining copies of the relevant disposal certificates as issued by the landfill site operator
- A monthly track record of the volumes of waste disposed of and the cost thereof
- Access to all required adequate and regularly serviced waste transportation vehicles. These need to be operated by staff who receive regular environmental training on how to handle possible incidents/spills e.g. as a result of an accident.

- A possible commitment to delivering an add-on high-level support to waste minimisation and recycling systems including the provision of a Pay as You Throw System and the recovery of recyclables for the largest possible variety of waste types.

### *Typical Environmental Savings:*

Potentially harmful waste gets contained within a (lined) landfill site and does not pose a threat of pollution to unprotected surroundings including aquifers, wetlands, agricultural grounds etc.

### *Capital Costs:*

No capital cost – just choose your waste service provider carefully and insist on a proven track record and adequate practical waste management experience. Ideally, the company should be part of a nationally recognized interest group or quality assurance association such as the Institute of Waste Management Southern Africa (IWMSA).

### *Typical Payback Period:*

n/a

### *Possible Financial Implications of Waste Dumping:*

Picking up dumped or littered waste can be up to 30 times more expensive than the cost for waste which is properly collected, transported and then landfilled.

Extensive costs for rehabilitation of contaminated land (e.g. bioremediation of waste oil or other hazardous wastes) can be legally imposed onto the original waste generator (in this case a hotel) and run into hundred of thousands of rands in addition to a possible penalty for negligence of the duty of care.

The image and reputation of a hotel can suffer greatly if such cases are made public, which is increasingly the case.



### *Did you know?*

Cleaning up of littering alone costs the City of Johannesburg about R74-million a year while illegal dumping costs another R80-million

Prolific dumping of builders' rubble in urban areas is a major threat to remaining wetlands and open surface waterways. Fortunately, and due to increased resource demand in most larger cities, an increasing amount of clean builders rubble now gets crushed and processed to become secondary brick building material. Dumping of tyres contributes greatly to the population explosion of mosquitos who love to breed in any stagnant rainwater trapped within.

# An accurate skip, bin or bag based “pay as you throw” service contract agreement in cases where the establishment uses a private waste removal company and not municipal waste services

*Request a “Pay as you throw contract” from waste service provider and request monthly statistics on waste generated and amounts of recyclables recovered including any resulting financial savings received from rebates.*

## **Introduction:**

A “Pay as you throw contract” enables the hotel to save money on waste disposal because they need only pay for waste generated which gets collected for disposal.

Furthermore, by demanding a monthly measurement of waste records from the service provider, the hotel is able to manage waste more effectively because it is difficult to manage what is not measured. Only when a first baseline is established can a hotel assess any progress made with any in-house waste minimisation initiative.

## **Major benefits:**

- Reduce cost of waste disposal
- Reduce waste going to landfill
- Resource conservation from waste that gets recycled rather than landfilled
- Recover money from recyclables given back by waste company as rebates

## **Typical Environmental Savings:**

Extension of Landfill space

### *Capital Costs:*

None (The criteria are already included in the terms of contract).

### *Typical Payback Period:*

Immediate (Savings on cost of disposal)

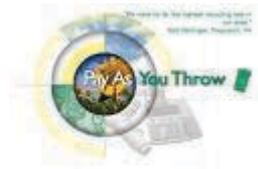
### *Did you know?*

In the Western Cape, 90 percent of the Province's waste is disposed of on landfill sites, nearly half of which are not licensed. It is estimated that the Western Cape has only about 5 years of cumulative landfill airspace left.

Landfills cost millions of rand to develop and run and pose environmental and health risks, including groundwater pollution, air pollution from burning on-site, and health risks for the people who recover wastes on-site for recycling



*Pay as you throw*



*Pay as you throw logo*



*You only pay for what you throw*