



**environment & tourism**

---

Department:  
Environmental Affairs and Tourism  
REPUBLIC OF SOUTH AFRICA

---

**NATIONAL POLICY DEVELOPMENT PROCESS  
FOR HEALTH CARE RISK WASTE  
MANAGEMENT**

**POLICY ON HEALTH CARE RISK WASTE  
MANAGEMENT**

**DRAFT**

Report No:	Draft 2
Date:	12 <sup>th</sup> December 2008
Author :	Waste Stream Management

## TABLE OF CONTENTS

<b>GLOSSARY OF TERMS.....</b>	<b>3</b>
<b>ABBREVIATIONS.....</b>	<b>6</b>
<b>PURPOSE OF THE DOCUMENT.....</b>	<b>7</b>
<b>VISION.....</b>	<b>7</b>
<b>SCOPE.....</b>	<b>7</b>
<b>1 INTRODUCTION.....</b>	<b>8</b>
<b>2 BACKGROUND.....</b>	<b>8</b>
<b>3 INTERNATIONAL SITUATION.....</b>	<b>10</b>
<b>4 POLICY OBJECTIVES.....</b>	<b>11</b>
<b>5 FOCUS AREAS.....</b>	<b>14</b>
<b>6 EXISTING REGULATORY FRAMEWORK.....</b>	<b>14</b>
<b>7 POLICY IMPLEMENTATION.....</b>	<b>18</b>
<b>8 SCHEDULE 1: AIR EMISSION STANDARDS –INCINERATION.....</b>	<b>20</b>
<b>9 SCHEDULE 2: NON-COMBUSTION FACILITES.....</b>	<b>21</b>
<b>10 SCHEDULE 3: HEALTH CARE RISK WASTE MANAGEMENT PLANS.....</b>	<b>22</b>

## **GLOSSARY OF TERMS**

### **Minister**

The Minister of Environmental Affairs and Tourism.

### **Department**

The National Department of Environmental Affairs and Tourism (DEAT).

### **Best Practicable Environmental Option**

The option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term.

### **Disposal**

The burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.

### **Environmentally Sound Management (of waste)**

Taking of all practicable steps to ensure that waste is managed in a manner that will protect health and the environment.

### **General Waste**

Waste that does not pose an immediate hazard or threat to health or to the environment, and includes (i) domestic waste, (ii) building and demolition waste, (iii) business waste, and (iv) inert waste.

### **Generators**

Organisations and their associated personnel (including for example, owners, staff and board members) as follows:

- Acupuncturists and other similar premises where alternative medicine is practised;
- Ambulance and special emergency service depots;
- Clinics for medical, dental or similar purposes;
- Dental hospitals, surgeries and laboratories;
- Funeral undertakers and morticians;
- General practitioner clinics;
- Health centres;

- Hospitals;
- Medical research institutions;
- Pathological and microbiological laboratories;
- Pharmaceutical manufacturers and pharmacies;
- Residential and dedicated nursing homes;
- Specialist medical practitioners ;
- Tattooists, body piercers; and
- Veterinary hospitals, surgeries, clinics, laboratories and pet shops.

#### **Hazardous Waste**

Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

#### **Health Care General Waste**

Means the non-hazardous component of waste generated by a generator and can include liquids, but excludes-

- health care risk waste; and
- isolation waste.

#### **Health Care Risk Waste**

Means waste capable of producing any disease and includes but is not limited to the following:

- laboratory waste;
- pathological waste;
- isolation waste;
- genotoxic waste;
- infectious liquids and infectious waste;
- sharps waste;
- chemical waste; and
- pharmaceutical waste.

#### **Health Care Waste**

**Means health care general waste and health care risk waste.**

#### **Incineration**

**Any dedicated method, technique or process to convert waste to flue gases and residues by means of thermal oxidation.**

#### **Non-combustion**

**Any method, technique or process for microbial inactivation or for otherwise altering the biological, chemical or physical characteristic of health care risk waste so as to sterilize such health care risk waste by any means of technology which does not constitute incineration.**

**Pathological (otherwise known as anatomical) waste includes**

- **deceased animals or animal parts infected with zoonotic diseases;**
- **human and animal tissues, organs, body parts, blood, fluid blood products and body fluids;**
- **containers or equipment containing blood that is fluid or blood from animals known or suspected to be infected with any zoonotic disease; and**
- **human foetuses;**

**but excludes teeth, hair, and animal carcasses generated by the public;**

#### **Treatment**

**Any method, technique or process that is designed to (i) change the physical, biological or chemical character or composition of healthcare risk waste, or (ii) remove, separate, concentrate or recover a hazardous or toxic component of healthcare risk waste, or (iii) destroy or reduce the toxicity of healthcare risk waste, in order to minimise the impact of the waste on the environment prior to further use or disposal.**

#### **Waste Management Hierarchy**

**The Waste Management Hierarchy reflects the different waste management options (reduction, re-use, recycling, recovery, treatment/destruction, and disposal) that should all form part of an integrated waste management system.**

## ABBREVIATIONS

<b>DEAT:</b>	<b>Department of Environmental Affairs and Tourism</b>
<b>BAT:</b>	<b>Best Available Techniques</b>
<b>BEP:</b>	<b>Best Environmental Practice</b>
<b>BPEO:</b>	<b>Best Practicable Environmental Option</b>
<b>ECA:</b>	<b>Environment Conservation Act, 1989 (Act 73 of 1989)</b>
<b>HCW:</b>	<b>Health Care Waste</b>
<b>HCRW:</b>	<b>Health Care Risk Waste</b>
<b>HCGW:</b>	<b>Health Care General Waste</b>
<b>IPWM:</b>	<b>Integrated Pollution and Waste Management</b>
<b>NEMA:</b>	<b>National Environmental Management Act, 1998 (Act 107 of 1998)</b>
<b>NEMAQA:</b>	<b>National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)</b>
<b>NEMWB:</b>	<b>National Environmental management: Waste Bill</b>
<b>NWMS:</b>	<b>National Waste Management Strategy</b>

## **PURPOSE OF THE DOCUMENT**

**This policy document presents the framework within which the healthcare risk waste shall be implemented in South Africa:**

## **VISION**

**Environmentally sound management of healthcare risk waste in South Africa in accordance with the National Waste Management Strategy in an integrated manner that is environmentally and economically sustainable while being occupationally safe and safe to the public.**

## **SCOPE**

**The policy deals with healthcare risk waste, its management and the treatment thereof.**

## 1 INTRODUCTION

---

Healthcare waste management was identified as one of the priority issues in the National Waste Management Strategy that requires immediate attention hence the need to focus on health care waste and draft a policy and regulations. This *Policy on Healthcare Risk Waste Management* confirms the South African Government's commitment to the continuous development and implementation of waste management options that are consistent with the principles of the waste management hierarchy. It presents Government's vision to incorporate a range of different technologies, including incineration and steam sterilisation, into the country's waste management system to ensure the environmentally sound management of healthcare risk waste in the country.

South Africa has a network of healthcare facilities located across the country, which provides a significant opportunity for healthcare risk waste management. Traditionally management of healthcare risk waste has caused problems to society and communities due to the lack of environmentally acceptable treatment options and associated performance standards, and insufficient attention to environmental and safety impacts putting people and the environment at unacceptable risk. This healthcare risk waste management policy aims at providing clear direction to the healthcare providers and the waste management industry regarding the standards and performance requirements to be met.

## 2 BACKGROUND

---

Recent studies have established that the total healthcare risk waste (HCRW) generated across South Africa now amounts to some 42,2000 tones per annum. This waste poses a risk to society, including health care professionals, patients and visitors, workers at transport companies, treatment plants and disposal sites, as well as people being exposed to spills and unsuitable disposal practices. In addition, illegal dumping of HCRW poses a risk to the general public. Although most healthcare facilities have established some form of HCW management system, investigations have revealed that there is generally a shortage of both human and financial resources, a lack of awareness and limited training in the various roles and functions

required for responsible HCW management, all contributing towards a need for improved standards of HCW management.

Traditionally HCRW was incinerated prior to disposal to landfill. More recently alternative methods of treatment, specifically non-combustion technologies, have come into operation. The use of alternative technologies was largely due to the inability of existing incinerators to meet air quality standards and the pressure of the public to address these concerns around air emissions. There is, however, still a lack of national standards and guidelines to manage, control and monitor both combustion and non-combustion HCRW treatment technologies. Furthermore the discrepancies in existing standards in some Provinces for the management as well as the treatment and disposal of HCRW further contribute to the problem. This shortcoming makes the setting of conditions during permitting, as well as verification and auditing during operation, difficult.

The lack in policy direction has resulted in or contributed to a number of constraints. These include poor environmental performance related to waste management in the country; the lack of, delayed or conflicting decision-making regarding the authorisation of alternative treatment technologies; uncertainty in Government and industry with regard to exploring and developing these technologies as healthcare risk waste treatment options, and significant opposition from certain sectors of society to particular technologies of healthcare waste treatment.

South Africa has several notable waste management policies, plans and strategies that support the waste management hierarchy concept. However, the development and implementation of certain waste management alternatives, which would allow healthcare risk waste to be managed within the waste hierarchy, have been restricted partly due to the absence of decisive national policy related to healthcare risk waste management, including treatment, separation at source, storage, packaging, transportation, treatment and disposal.

This policy responds to these issues, and provides the certainty required to allow for the development of responsible healthcare waste management in the country, particularly the segregation of waste at source thereby reducing the volumes

requiring treatment; and the establishment and operation of treatment facilities. Regulations will be drafted in line with the policy providing the mechanisms to be followed in healthcare waste management.

### **3 INTERNATIONAL SITUATION**

---

Key focus internationally is to provide a safe and cost-efficient HCRW management system that generates the least environmental impact. Internationally, the management of HCRW is very similar to that of South Africa in terms of separation of HCRW into i) sharps, ii) pathological waste, iii) pharmaceutical/chemical waste, iv) general infectious waste and other special types such as mutagenic waste etc. However, there are specific regional variations such as i) separation of needle and syringes before disposal vs. disposal as one unit (cost issue), ii) choice of colour coding (red vs. yellow), iii) use of disposable vs. reusable sharps containers, vi) use of disposable vs. reusable HCRW containers (cost and environment issue) etc.

The treatment of HCRW has evolved considerably since the times when each hospital operated a simple incinerator without any environmental protection measures. Increasing emission requirements resulting in increasing cost of flue gas cleaning for incineration plants, as well as unfavourable perceptions of incineration in many parts of the world, lead to the development of a range of non-incineration technologies for the treatment of HCRW as well as well as the development of HCRW incinerators that comply with the highest international environmental standards has resulted in greater choice of treatment technologies. Alternative technologies which are currently available internationally include:

#### **1. Low-heat thermal processes**

- Wet heat (steam), e.g. autoclaving and micro waving;
- Dry heat (hot air), e.g. conduction, natural or forced convection and thermal radiation.

#### **2. Chemical processes**

- Chemical sterilisation, e.g. with chlorine dioxide, bleach, (sodium hypochlorite), peracetic acid, or dry inorganic chemicals;
- Encapsulation.

#### **3. Irradiative processes**

- Electron beams;
- Cobalt-60 gamma rays;
- Ultra violet.

#### 4. Biological processes

- Enzymes

Non-incineration technologies are rapidly becoming the dominant treatment technologies primarily due to the increased costs associated with raised air emission control standards required for incineration facilities. The majority of non-incineration technologies employed fall in the first two processes listed above.

## 4 POLICY OBJECTIVES

---

HCRW Management shall follow these overall objectives:

1. Promote efficient resource use and harmonization of the environment and the economy.
2. Advance the implementation of an integrated waste management system for the country in line with the waste management hierarchy, by facilitating the move away from single waste management solutions towards the integration of incineration and other suitable treatment technologies.
3. Provide an effective legislative framework and minimum environmental requirements for the health care waste management, in line with international best available techniques (BAT) and best environmental practice (BEP).
4. All generators of HCRW are responsible for the safe management of such waste including handling, transport, treatment and disposal of these wastes in an environmentally sound manner that minimises risk to the community and staff involved in its management.
5. Each generator should have a comprehensive HCW management plan as part of an overall environmental management system, unless exempted by the responsible authority. The larger the organisation, the more comprehensive this plan must be.
6. Clear allocation of duty of care responsibility to the generator of HCRW that is assigned to the managing director, CEO or similar position of a health care facility who is liable in terms of any offences of mismanagement of HCRW.

7. There should be a designated individual/committee responsible for implementation of the HCW management plan.
8. Public health shall protected by limiting access to HCRW receptacles, waste stores etc. for patients, visitors and the general public.
9. Patient care procedures should incorporate controls to ensure minimisation of the HCRW generated.
10. Product selection and purchasing criteria should incorporate controls to ensure that less toxic/hazardous products are selected, without compromising product performance.
11. Waste minimisation and recycling of waste products shall be prioritised when possible in terms of occupational and public health and safety.
12. Green procurement should be applied where practically possible to avoid unnecessary environmental impact and harm related to management of HCRW.
13. All HCRW must be treated and disposed off at dedicated and authorised HCRW treatment and disposal facilities as close to the point of generation as is reasonable possible.
14. All treatment facilities for HCRW should be considered based on their merits. No preference for or against a particular type of technology provided that the treatment technology can comply with the required environmental performance standards.
15. After treatment the residues shall not be easily recognizable as being health care risk waste.
16. Pathological waste shall be incinerated and rendered non-recognisable
17. Segregation of health care waste shall be in force to ensure that no HCRW is disposed of as domestic waste and that no domestic waste is disposed and treated unnecessarily as HCRW at high cost while causing environmental impacts.
18. HCRW and HCGW receptacles shall be available at source of HCRW generation to ensure immediate and correct segregation of waste at source.

19. Sharps waste shall be rendered unusable and no longer in its original shape and form.
20. Reusable items shall be preferred to disposable items whenever it is clinically appropriate, environmentally sound and practical to do so.
21. Storage facilities for HCRW should be suitably sited, lockable, hygienic and appropriately sign-posted.
22. Facilities must develop a spill management plan with well defined policies and procedures for handling spills safely.
23. Back up plans shall be in place to ensure immediate access to service personnel and replacement units and/or other contingency plans when the treatment plant is out for planned or unplanned maintenance and/or repair.
24. A well documented monitoring protocol and verifiable monitoring data must be available to document the ongoing compliance with the environmental requirements of the treatment technology.
25. Health care establishments must ensure that safe work practices are developed and maintained.
26. Occupational health and safety shall be promoted in the management of HCRW. Hence, heavy and awkward lifts shall be avoided where possible by use of mechanical devices; exposure to sharps shall be avoided by use of puncture resistant receptacles and effective segregation of waste; and exposure to pathogens shall be avoided by use of leak and puncture resistant receptacles and use of relevant personal protective equipment (PPE).
27. Application of Best Practicable Environmental Option when setting standards for management of HCRW.
28. Cradle-to-grave approach of reducing environmental, health and safety impacts of HCRW management.
29. Support the development of suitable HCW management infrastructure to sustain further development of the economy.
30. Promote technology advancement and skills development through exposure to, and transfer of, advanced international knowledge and experience.

**31. Contribute to South Africa meeting its international commitments in terms of the Stockholm and Basel Conventions**

## **5 FOCUS AREAS**

---

To manage healthcare waste effectively, consideration needs to be given to:

- generation and minimization;
- source separation and segregation;
- identification and classification;
- handling and storage;
- packaging and labelling;
- transportation inside and outside of healthcare facilities;
- treatment;
- disposal of residues (including emissions);
- occupational health and safety; public and environmental health;
- stakeholder and community awareness and education; and
- research and development into improved technologies and environmentally friendly practices

This policy aims to address all these issues and provide support for the achievement of improved environmental performance in managing health care waste.

## **6 EXISTING REGULATORY FRAMEWORK**

---

Several laws and regulatory instruments provide the framework for achieving environmentally sound and integrated waste management in the country. Within this framework, the waste management hierarchy, resource recovery, thermal waste treatment and environmental standards are included. The policy supports these provisions by serving the objectives of the various pieces of legislation, and stipulating the necessary and appropriate details on waste incineration and co-processing activities for incorporation into the regulatory framework.

### **Integrated Pollution and Waste Management Policy, 2000**

This White Paper details government's policy on pollution and waste management and has formed the point of departure for the National Waste Management Strategy. The goal of the Integrated Pollution and Waste Management (IP&WM) policy is to move

away from a previously fragmented and uncoordinated waste management system to an integrated waste management system and it defines government's "cradle-to-grave" approach to the management of waste.

#### **National Waste Management Strategy (1999)**

The NWMS initiated action to ultimately implement an integrated waste management system for South Africa, and presented a long-term plan for addressing key issues, needs and problems related to waste management. While the long-term objective of the strategy is waste prevention and minimisation, it includes a number of remedial actions such as improved waste treatment options, e.g. incineration. The strategy identified the need for hazardous waste treatment capacity in the country, including organic hazardous waste incineration.

#### **Environment Conservation Act (Act 73 of 1989)**

This Act is regarded as the most important piece of legislation governing waste in South Africa, particularly solid waste, since, unlike most other legislation regulating waste, it makes provision for the regulation of waste specifically and with the aim of providing for the protection of the environment. The amendment of ECA has allowed for transfer of duties relating to management of disposal of waste from DWAF to DEAT, effective from 01 January 2006. ECA provides for the formulation of a definition of waste by regulation. A regulation setting out such a definition<sup>2</sup> was passed in 1990 and in terms of the regulation, waste is accordingly defined as:

*“an undesirable or superfluous by-product, emission, residue or remainder of any process or activity, any matter, gaseous, liquid or solid or any combination thereof originating from any residential, commercial or industrial area, which is discarded by any person, is accumulated and stored by any person with the purpose of eventually discarding it with or without prior treatment connected with the discarding thereof, or which is stored by any person with the purpose of recycling, re-using or extracting a useable product from such matter”.*

Although the definition excludes certain types of waste, health care waste is not one of the exclusions and it is accordingly clear that health care waste falls within the scope of the Act. ECA accordingly places an obligation on both generators of health care waste, to ensure that their wastes are disposed of appropriately, and waste

operators, to handle such disposal in accordance with permit provisions. In addition to the provisions of section 20, the Act allocates powers to both the Minister of Water Affairs and Forestry and the Minister of Environmental Affairs and Tourism to pass regulations which expand the reach of the waste management provisions, although to date very few regulations have been passed in terms of the Act. The absence of regulations means that the potential for ECA to provide an effective and integrated management system for health care waste has not been realized. Health care waste is accordingly not specifically regulated under the Act.

#### **National Environmental Management Act (Act 107 of 1998)**

This Act introduces a comprehensive legal basis to give effect to the environmental rights contained in the Constitution of South Africa (Act 108 of 1996). It stipulates certain environmental principles that form the legal foundation for sustainable environmental management, and incorporates the concepts of sustainable development, the precautionary and preventative approach, and best practicable environmental option. It also provides for cooperative environmental governance by establishing principles for decision making on matters affecting the environment, institutions that will promote cooperative governance and procedures for coordinating environmental functions exercised by organs of state and to provide for matters connected therewith.

#### **NEM: Waste Management Bill**

This Bill is seen as the single piece of legislation that addresses waste management in a holistic and integrated manner. It acknowledges the internationally recognised hierarchy of waste management, stating that sustainable development requires that waste generation is avoided, or if it cannot be avoided, that it is reduced, re-used, recycled or recovered, and as a last resort treated and/or safely disposed of. The Bill provides for setting national norms and standards, and specific waste management measures that include the licensing of waste management activities, identification of priority wastes, and prescribing measures for dealing with such wastes.

#### **Atmospheric Pollution Prevention Act (Act 45 of 1965)**

**This Act makes provision for the approval of Scheduled Processes, which includes waste incineration. Guidelines related to the scheduled processes include emission standards, and operational and technology requirements for waste incineration.**

**NEM: Air Quality Management Act (Act 39 of 2004)**

**This Act is systematically replacing the Atmospheric Pollution Prevention Act, and provides for the listing of activities resulting in atmospheric emissions, and establishing minimum emission standards for substances resulting from these activities. The National Listed Activities and Minimum Emission Standards Programme include proposed air emission standards for waste incineration.**

**Other applicable legislation**

**Other legislations that apply to healthcare waste management (to some or limited extent)**

**include:**

- **National Health Act (Act 61 of 2003)**
- **Human Tissue Act (**
- **Hazardous Substances Act (Act 15 of 1977)**
- **Occupational Health and Safety Act (Act 85 of 1993)**

**Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal, 1989**

**South Africa ratified this Convention in 1994. It aims toward the reduction and minimisation of hazardous waste, and treatment and disposal thereof as close to its source as possible. In June 2008 the World Forum on Waste Management for Human Health and Livelihood was constituted, and a decision made by parties to the convention to start the international technical assistance program for the environmentally sound co-processing of hazardous and other waste in the energy intensive industry, including the cement industry, within the context of the Basel Convention implementation.**

**Stockholm Convention on Persistent Organic Pollutants (2004)**

This convention aims to eliminate the manufacture and use of particularly toxic POPs. The Convention also aims to clean-up existing stockpiles, dumps and equipment containing POPs, and includes several recommendations for the treatment of waste through incineration or co-processing. It further requires from those party to the convention to take appropriate measures so that these wastes are disposed of in such a way that the POP content is destroyed or irreversibly transformed.

## **7 POLICY IMPLEMENTATION**

---

- 1. The Department will continue to promote the Waste Management Hierarchy and strive towards waste reduction and minimisation through its plans and programmes for the integrated management of waste in the country.**
- 2. The Department will make informed decision-making around the use of HCRW treatment alternatives, and guide the consistent application of regulatory instruments to encourage the development of a wide range of HCRW management treatment technologies.**
- 3. Although certain technologies including incineration and autoclaving of HCRW are accepted waste management technologies in terms of this policy, each individual project proposal will be considered on its own merit.**
- 4. Proponents of these technologies must comply with all legal requirements and provisions of current and future legislation, policies, strategies etc. relevant to health care risk waste.**
- 5. HCRW management shall be conducted in compliance with relevant and prevailing legal and other requirements, including sector specific guidelines and conditions of authorisation that includes, among others:**
  - Specific norms and standards, e.g. emission standards and pollution control measures;**
  - Monitoring and control of waste handling, storage and treatment;**
  - Health and safety standards and exposure to chemical and biological hazards;**
  - Suitable site location and adequate infrastructure;**
  - Microbial inactivation;**
  - Air emission control and abatement, and mandatory emission monitoring;**

- **Qualification and training requirements;**
  - **Operational procedures and management;**
  - **Environmental monitoring, audit and reporting requirements.**
- 6. The Department will ensure procedures are put in place for the efficient and integrated consideration of health care risk waste projects in terms of different legal requirements within its mandate, i.e. Environmental Authorisation (NEMA), Air Emission Licence (NEMAQA), and Waste Management Licence (Waste Bill).**
  - 7. The Department is committed to supporting the implementation of this policy in terms of monitoring, enforcement and capacity building through the development of regulations, specifically as it concerns the current proposals for health care risk waste treatment.**
  - 8. The Department will continue to develop the necessary regulatory tools (legislation, norms and standards, sector guidelines and conditions of authorisation) relevant to health care risk waste, for the implementation of and compliance with best available technology and best environmental practice, as appropriate, to ensure the protection of human health and the environment.**
  - 9. The requirements in Schedules 1, 2 and 3 of this policy for health care risk waste management must as a minimum be complied with at all times.**

## 8 SCHEDULE 1: AIR EMISSION STANDARDS –INCINERATION

All health care risk waste incinerators brought into operation after the final gazetting of this policy must demonstrate the ability to comply with the air emission standards below. Requirements for existing facilities are currently the subject of review through the APPA Review Process and National Listed Activities and Minimum Emission Standards Programme, and standards of operation for these facilities will be brought in line through these processes within agreed transitional arrangements.

### Air Emission Standards for the Incineration of Health Care Risk Waste in Dedicated Incinerators

EMISSIONS	AIR EMISSION STANDARD <sup>1</sup>
PM (Total Particulate Matter)	10
TOC	10
CO	50
HCl	10
HF	1
SO <sub>2</sub>	50
NO <sub>x</sub>	200
NH <sub>3</sub>	10
Hg	0.05
Cd + Tl	0.05
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V (Sum total)	0.5
PCDD/PCDF (ng/Nm <sup>3</sup> I-TEQ)	0.1

1. Concentration expressed as mg/Nm<sup>3</sup> (Daily Average) unless otherwise stated, and at 'normalised' conditions of 10% O<sub>2</sub>, 101.3 kPa, 273 K / 0 °C, dry gas.

**9 SCHEDULE 2: NON-COMBUSTION FACILITIES TREATMENT STANDARDS**

---

1. Microbial inactivation standards which must be achieved at all times are as follows:

- (1) Vegetative bacteria, fungi, lipophilic/hydrophilic viruses, parasites and mycobacteria:  $\geq 6$  Log<sub>10</sub> reduction;
- (2) *Geobacillus stearothermophilus* spores or *Bacillus atrophaeus* spores:  $\geq 4$  Log<sub>10</sub> reduction

2. Representative biological indicators

(1) Representative biological indicators must be used to indicate microbial inactivation standards.

(2) One or more of the following organisms from each group must be used for test purposes:

- Vegetative Bacteria:

- Staphylococcus aureus* (ATCC 6538)

- Pseudomonas aeruginosa* (ATCC 15442)

- Fungi:

- Candida albicans* (ATCC 18804)

- Penicillium chrysogenum* (ATCC 24791)

- Aspergillus niger*

- Viruses:

- MS-2 Bacteriophage* (ATCC 15597 – B1)

- Mycobacteria:

- Mycobacterium terrae*

- Mycobacterium bovis* (BCG) (ATCC 35743)

- Spores:

- Geobacillus stearothermophilus* (ATCC 7953) ( )

- Bacillus atrophaeus* (ATCC 9372)

## **10 SCHEDULE 3: HEALTH CARE RISK WASTE MANAGEMENT PLANS**

---

Any generator, transporter, transfer facility, treatment facility and disposal facility must have the relevant approvals from the competent authority in terms of South African environmental legislation including a healthcare risk waste management plan. The following sections set out the contents that would as a minimum, where relevant, need to be included in the plans generated by these activities:

1. Company details including location, head of facility, capacity, service provided etc.
2. Clear management and organisational structure with unambiguous responsibilities, reporting lines and feedback mechanisms.
3. All required national/provincial/local authorisations' including but not limited too licences, permits, records of decisions and environmental authorisations.
4. Detailed site plan.
5. HCW generation.
6. Waste segregation.
7. Packaging.
8. Collection and on-site transportation.
9. On-site storage.
10. Off-site transportation.
11. Waste Treatment.
12. Disposal.
13. Suitable technical infrastructure.
14. Qualified and skilled employees.
15. Health, safety and security management.
16. Mitigation measures undertaken and proposed to minimise adverse impacts.
17. Error reporting system (including preventive and corrective action) for employees.
18. Contingency plan.
19. Emergency and safety equipment and procedures.
20. Maintenance program.

21. **Record keeping.**
22. **Regular internal audits, independent audits, emissions monitoring and reporting.**
23. **Awareness and training.**
24. **Employee health checks.**
25. **Dissemination of information.**