NZS 4304:1990

NEW ZEALAND STANDARD

HEALTH CARE WASTE MANAGEMENT

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Standards Association of New Zealand

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RELATED DOCUMENTS

Reference is made in this Standard to the following:

NEW ZEALAND STANDARDS

NZS 5433:1988	Code of practice for the transport of hazardous substances on land
NZS 7603:1979	Specification for refuse bags for local authority collection (low density polyethylene)

OTHER PUBLICATIONS

NATIONAL RADIATION LABORATORY

NRL C1:1983	Code of practice for the safe use of unsealed radioactive materials
NRL C3:1982	Code of practice for the use of unsealed radioactive materials in medical practice

NATIONAL HEALTH INSTITUTE

NHI 1981	Code of practice for steam sterilization

DEPARTMENT OF HEALTH

1979	Code of practice for ethylene oxide sterilization
1984	Guidelines for the parenteral administration of cytotoxic agents

NEW ZEALAND LEGISLATION

Asbestos Regulations 1983
Clean Air Act 1972
Dangerous Goods Act 1974
Explosives Act 1957

The users of this Standard should ensure that their copies of the above-mentioned New Zealand Standards are the latest revisions or include the latest amendments. Such amendments are listed in the annual SANZ *Catalogue* which is supplemented by lists contained in the monthly magazine *Standards* issued free of charge to committee and subscribing members of SANZ.

FOREWORD

This Standard has been prepared to rationalize and recommend methods for the management of health care wastes within New Zealand.

It sets out to define the types of waste that may be generated in hospitals and other establishments which come within the scope of this Standard and to recommend methods of dealing with the wastes so generated.

Health care establishments which come within the scope of this Standard include hospitals, doctor's surgeries, dental surgeries, clinics, veterinary surgeries, pharmacies, nursing homes, blood transfusion centres, laboratories, pet shops and boarding kennels, medical research establishments, and any other premises which generate waste as defined including homes at which medical treatments take place. It also covers pharmaceutical product manufacture and distribution.

REVIEW OF STANDARDS

Suggestions for improvement of this Standard will be welcomed. They should be sent to the Director, Standards Association of New Zealand, Private Bag, Wellington.

NEW ZEALAND STANDARD

HEALTH CARE WASTE MANAGEMENT

1 SCOPE

1.1
This Standard sets out three objectives:

(a) To identify and define health care wastes;

(b) To offer guidance to designers and operators of establishments responsible for generating such wastes to enable them to be safely and economically disposed of;

(c) To indicate preferred methods for the disposal of health care wastes.

2 APPLICATION

2.1
This Standard is the agreed basis for acceptable practice for the management of health care related wastes as defined in section 4.

3 DEFINITIONS

3.1
In this Standard, unless inconsistent with the context the following definitions shall apply:

COLLECTION. The aggregation of wastes from primary sources or storage areas for movement to a waste holding area or from waste holding areas for movement to pre-disposal storage.

CONTAINER. A receptacle for the storage of wastes. It may be a bag or a hard shell vessel.

CYTOTOXIC WASTE. Waste produced during the preparation, transport or administration of cytotoxic drug therapy.

GENERAL WASTE. Waste generated in health care practice that is similar to domestic waste.

HARD SHELL CONTAINER. A vessel made of rigid plastics or metal with a tightly sealed lid. These may be reusable or disposable in a manner appropriate for their contents.

MACERATION. The disintegration of waste such as to render it physically suitable for disposal to the sewerage system.

MOVEMENT. The transfer of waste material between storage areas within the establishment.

PATHOLOGICAL WASTE. Waste materials that are offensive to the senses or hazardous to public health. This applies mainly to anatomical wastes such as human tissue and organs or animal tissue organs and carcasses. Other wastes deemed to be pathological are materials that may be contaminated by highly infectious organisms.

PRE-DISPOSAL STORAGE. Storage of wastes collected from waste holding areas for final disposal.

PRIMARY STORAGE. Storage of wastes near the source.

SHARPS. Waste equipment or utensils which are capable of injuring personnel or puncturing containers.

SPECIAL WASTES. Wastes that present hazardous conditions and situations to personnel and operatives responsible for handling and disposal.

SEGREGATION. The separation of wastes according to classification prior to storage.

STORAGE. The accumulation of wastes after segregation in a specified container in a specific location.

TRANSPORTATION. The carriage on public roads of waste materials for disposal.

WASTE HOLDING. Storage of wastes collected from primary storage areas such as a block of operating theatres, a laboratory wing, a floor of patient rooms.

3.2
In this Standard the word 'shall' indicates a requirement that is mandatory, in order to comply with the Standard, while the word 'should' indicates a recommended practice.

4 CATEGORIES OF HEALTH CARE WASTE

4.1
Health care waste shall be categorized as specified in 4.2 to 4.5 inclusive.

4.2
General waste
These wastes are non-problematic being similar to domestic wastes. They may be disposed of in a manner appropriate for the proper disposal of

domestic refuse or liquid waste although in hospital and similar institutions the volume of such wastes may necessitate special arrangements.

They are subdivided as follows:

(a) Ordinary waste
Ordinary waste includes such wastes as non-infectious wastes, packaging materials, non-infectious animal bedding, laundry wastewater and other non-hazardous substances.

(b) Kitchen waste
Kitchen wastes are classified separately due to the nature and volume of the wastes and the possibility of further use e.g. animal feed etc.

4.3
Special wastes

4.3.1
These wastes are hazardous or aesthetically obnoxious and demand special attention to ensure safe disposal. They include:

(a) Anatomical waste, i.e. minor anatomical waste, amputations, foetuses, placentas, blood (together with related swabs and dressings), infected animal carcasses etc.;

(b) Soiled dressings, swabs and all other contaminated waste from treatment areas;

(c) Material other than that which is to be recycled (e.g. linen) from cases of infectious diseases;

(d) Disposables, i.e. syringes, hypodermic needles, scalpels, razor blades, and plastic articles such as probes, tubes, urine containers, bed pans, gloves, masks, syringe bottles, broken glass, etc.

NOTE - Sharps are an important sub-category of special wastes that need to be managed as part of, but distinguished from, the rest of the special waste stream. All sharps pose a potential hazard and can cause injury through cuts or puncture wounds. Discarded sharps may be contaminated with blood, body fluid, microbiological materials, or toxic, cytotoxic or radioactive substances. The disease potential is great if the sharp was used in the treatment of a patient with an infection or infectious disease.

(e) Specific wastes. e.g. dialysis filters, plaster of paris etc. which may need special disposal methods;

(f) Waste from laboratories and post-mortem waste other than that classified in (a), (b) and (c);

(g) Pharmaceutical and chemical waste i.e. pharmaceuticals and chemicals which are surplus to requirements or are to be discarded and present a hazard to employees or the general public.

NOTE - Pharmaceutical and chemical wastes may require specialist advice as to the most appropriate method of disposal within the special waste category.

(h) Any other material which is assessed as special waste in accordance with Appendix A.

4.3.2
Where incineration is used as the means of disposing of special wastes then the existence of plastics in the special waste stream poses peculiar difficulties. In particular, chlorinated plastics produce hazardous air emissions when burnt. It is therefore especially important that incinerators burning special wastes including plastics comply with the requirements of the Clean Air Act.

4.4
Radioactive waste
Any waste from tasks involving the use of radioactive materials.

4.5
Cytotoxic waste
Any waste from the preparation or use of cytotoxic substances.

5
WASTE MANAGEMENT POLICY

5.1
General

5.1.1
The establishment generating the waste shall be responsible for ensuring the safe disposal of all health care wastes arising within the organization. A policy shall be established to ensure that the requirements of this Standard are achieved. One of the most important aspects of the management policy should be to minimize the generation of waste so that the cost to the organization is minimized and the efficiency is improved. When wastes are removed by a contractor for disposal elsewhere there is still a need for the waste producer to be aware of the disposal methods to be used and to be satisfied as to their safety and effectiveness and that they are acceptable to the local authority.

5.1.2
Prior to the use of any hazardous chemical a plan shall be in place for its disposal, including its by-products. This plan must have the approval of the Department of Health, the Area Health Board or the local authority, as appropriate. In the case of solvents the plan must also comply with requirements of the Dangerous Goods Act.

5.1.3
All establishments shall nominate or appoint a

person to be responsible for organizing and supervising the handling and disposal of waste within the organization. Such a person shall be, or shall nominate a person, as the authorised person within the organization to ensure that compliance with the requirements of this Standard is maintained.

5.1.4
The nominated waste officer shall carry out an inspection programme to ensure that the requirements of this Standard are achieved.

5.1.5
A training programme shall be established to ensure that staff are fully conversant with the requirements of this Standard.

5.2
Training and supervision

5.2.1
Training

5.2.1.1
Health care establishments should set up a training programme to acquaint new employees with the waste handling procedures applicable in the establishment.

5.2.1.2
The procedures should be in written form and be available to all personnel involved in waste handling.

5.2.1.3
Training shall teach:

(a) The hazards of health care waste;

(b) The methods of preventing the transmission of disease caused by infection relating to waste handling;

(c) Safety procedures for dealing with chemical, pharmaceutical, and radioactive waste and sharps;

(d) The correct methods of segregation, handling, moving, transportation and disposal of the different categories of waste;

(e) Correct procedures for action and notification in the event of an accident.

It is important that such training is received regularly and updated as conditions change.

5.2.2
Supervision
Good supervision is essential to maintain the efficiency and safety of waste control and handling procedures. If outside contractors are used for handling waste then the establishment shall ensure that the contractor's personnel are trained and supervised.

6
GENERAL PROVISIONS

6.1
Segregation of wastes

6.1.1
Wastes shall be segregated according to the classification in table 1. Each establishment shall determine those wastes which may be classed as general and ensure separation from special wastes. If wastes are mixed then all wastes shall be classed as special waste.

6.1.2
All waste shall be stored separately from non-waste and a dedicated refrigerator used for all waste requiring refrigeration.

6.2
Storage areas

6.2.1
Waste holding areas and pre-disposal storage areas shall be secure, aerated enclosures. All exhaust vents shall discharge to the outside and the outlet shall be situated such that it:

(a) Obviates entrainment of the exhaust into any intake vents and

(b) Precludes the possibility of the exhaust air from entering the building or adjacent buildings.

6.2.2
Waste holding and pre-disposal storage areas shall be remote from supply rooms and food preparation areas.

6.2.3
Refrigerated storage shall be maintained at or below 4 °C.

6.2.4
The area shall be designed and constructed such that cleaning as in 7.4 can be easily achieved. Walls and floors shall be of impervious material and floors graded to a drainage outlet. Adequate lighting shall be provided.

6.3
Plastic bags

6.3.1
Plastic bags for the collection of general waste shall comply with NZS 7603.

Table 1
COLOUR CODING AND MARKING OF WASTES

Waste category	*Colour code*	*Additional marking*	
		Type of marking	*Application*
General	Black	Warning - contains glass	When appropriate
Special	Yellow	Biological hazard symbol	All infected waste
Radioactive	None	Ionizing radiation symbol	All waste
Cytotoxic	Purple	Telophase symbol	All waste

6.3.2
Plastic bags for the collection and storage of special wastes shall have the following properties:

(a) Be a minimum thickness of 50 microns if of low density, or 25 microns if of high density;

(b) Have a maximum capacity of 100 litres;

(c) Bags to be used for autoclaving shall be suitable for withstanding the high temperatures involved in the process and shall be permeable to allow the penetration of steam;

(d) Conform to the colour coding and marking system specified in table 1 and Appendix B.

Bags of greater thickness and/or lesser capacity may need to be used depending upon conditions of service.

6.3.3
Paper bags may be used *in lieu* of plastics for general waste provided that they are capable of holding contents with a weight of 30 kg, and have a wet strength of not less than 30 % of their strength when dry. Paper bags for general waste need not be coloured black, but any printing on them should preferably be black.

6.3.4
Closure of plastics bags shall be accomplished by twisting the neck of the bag and applying high strength twist ties, high strength ratchet ties or high density plastics adhesive tape. To facilitate closure, bags should not be filled more than two thirds of their capacity.

6.4
Hard shell containers

6.4.1
All hard shell containers shall be resistant to, impact, rupture and corrosion, and containers to be incinerated shall not be made of chlorinated plastics.

6.4.2
All hard shell containers shall have tightly fitting lids.

6.4.3
All hard shell containers and their lids shall be marked or labelled in accordance with Appendix B to identify the type of waste for which they are intended.

6.4.4
Hard shell containers intended for reuse and normally fitted with a liner shall be inspected after each use to ascertain that they are intact and without leaks. Any containers found to be defective shall be repaired before being reused or shall be scrapped.

6.4.5
Hard shell containers for sharps shall be non-reusable, leak proof and puncture proof with an opening/aperture wide enough to allow disposable materials to be dropped into the container by a single hand operation. Depending on the bulk of the disposable material for which the particular container is designed, the aperture should under normal conditions of use, inhibit removal of the contents. The container should be fitted with a carrying handle.

6.5
Movement of wastes within the establishment

6.5.1
All wastes shall be effectively segregated at the time and source of generation and bagged or containerized as appropriate. Any movement of wastes shall maintain the segregation needed to ensure subsequent safe disposal.

6.5.2
Waste in bags shall be moved only when the bags

have been sealed in accordance with 6.3.4.

6.5.3
All vehicles used for the movement of non-general waste shall have interiors of smooth, impervious construction to contain any spillage and to be able to be readily cleaned and sanitised.

6.5.4
The movement of wastes should be arranged so that the routes for waste materials do not cross or coincide with routes for clean materials. Passage through patient care areas should be minimized.

6.5.5
Chutes may be used for the movement of general wastes only.

7
MAINTENANCE AND CLEANING

7.1
Protective clothing for handling non-general waste

7.1.1
For personnel involved in cleaning waste containers, waste movement vehicles or pre-disposal storage areas the following protective clothing shall be worn:

(a) Water resistant coveralls;

(b) Rubber footwear;

(c) Heavy duty waterproof gloves;

(d) Eye protection, i.e. goggles or full face visor.

7.1.2
For personnel involved in collecting and moving waste the following shall be worn:

(a) Heavy duty gloves with extra long cuffs;

(b) Eye protection, respiratory protection and other protection as appropriate.

7.1.3
For movement of waste to a primary storage area protective clothing similar to that used in the working environment shall be worn. Special conditions applying to the work area shall apply to the movement of wastes to the primary storage area unless the wastes are suitably bagged and sealed within the work area.

7.1.4
The protective clothing shall be worn only when the operatives are actually working on wastes. At other times the clothing should be stored in a specified area. The clothing shall be washed down frequently and changed daily or after each shift whichever is shorter.

7.2
Vehicles for waste movement and transportation

7.2.1
Cleaning
Vehicles shall be cleaned after contamination and daily as follows:

(a) Scrub any heavily soiled areas;

(b) Wash all over with a germicidal detergent solution;

(c) Rinse and drain dry.

Mechanical cleaning may be used provided equivalent results are achieved.

7.2.2
Maintenance
Vehicles shall be thoroughly cleaned as above before any maintenance work is carried out on them.

7.3
Hard shell containers

7.3.1
Waste should be collected in the container, the container emptied in the storage area and then moved to the cleaning area for cleaning.

7.3.2
Hard shell containers which are to be reused shall be cleaned after each use as follows:

(a) Scrub any heavily soiled areas;

(b) Wash the interior of the containers using a germicidal detergent solution;

(c) Flush and drain the internal residue;

(d) Wash the interior;

(e) Flush and drain;

(f) Store the containers inverted on racks to dry.

7.4
Waste storage sites

7.4.1
Floors of waste holding areas and pre-disposal storage areas shall be washed daily with a germicidal detergent solution.

7.4.2
Walls and ceilings of waste holding areas and pre-disposal storage areas shall be washed with a germicidal detergent solution at 14-day intervals and after any contamination.

Table 2
MAXIMUM INTERVALS FOR COLLECTION OF WASTE

Type of waste	*Class of waste*	*Maximum interval for collection*		
		Primary storage	*Waste holding*	*Pre-disposal storage*
General	Kitchen	8 hours	24 hours	3 days
	Other	24 hours	24 hours	1 week
Special	All types	As generated	As necessary	As necessary

7.4.3
The requirements of 7.4.1 and 7.4.2 shall not apply to holding and storage areas used solely for radioactive waste.

7.5
Disposal of cleaning water
All waste water from any cleaning process shall be discharged into a sump where it shall be treated to the satisfaction of the relevant control authority before being discharged into a sewer. Under no circumstances shall cleaning water be discharged into a storm water drain.

8
COLLECTION SCHEDULE

8.1
The collection of general and special waste shall be carried out in accordance with the schedule shown in table 2.

9
GENERAL WASTE

9.1
Colour code
Plastics bags for general waste shall be black. Additional marking may be required as shown in table 1.

9.2
Kitchen waste

9.2.1
Kitchen waste shall be handled and stored in accordance with regulations governing food premises.

9.3
Ordinary waste

9.3.1
Waste holding areas for ordinary waste (i.e. general waste other than kitchen waste) shall comply with 6.2 and be maintained in accordance with 7.4.

9.3.2
Pre-disposal storage areas for ordinary waste shall meet the requirements of 6.2.1 and 6.2.2.

9.4
Glass waste

9.4.1
Primary storage containers for glass waste shall be puncture resistant. All seams shall prevent the contents from escaping.

9.5
Contamination

9.5.1
General wastes that are contaminated by special wastes shall be treated as special waste.

10
SPECIAL WASTES

10.1
General requirements

10.1.1
Anatomical waste, whether of human or animal origin e.g. amputations, foetuses, blood, animal carcasses etc., shall be double bagged in yellow bags clearly marked with the biological hazard symbol. Where it is necessary to store these for any length of time the bag should be clearly marked as to the contents and held under refrigeration.

10.1.2
Non-infectious liquid wastes may be disposed of via a suitable fixture into a sewage system in the same way as similar wastes generated in places other than health care premises.

Liquid wastes which may be infectious may, under some circumstances, be capable of treatment to permit disposal into the sewage system subject to the agreement of the local sewage disposal authority. Otherwise these wastes should be treated in the same manner as other infectious wastes.

10.1.3
The primary storage containers for sharps shall be sealed prior to collection and shall remain sealed until final disposal.

10.1.4
In waste holding areas and pre-disposal storage areas separate containers shall comply with 6.3.1 and 6.3.2.

10.1.5
Waste holding areas and pre-disposal storage areas shall comply with 6.2 and be maintained in accordance with 7.4

10.2
Chemical wastes

10.2.1
General
Prior to the disposal of chemical waste, the approval of the Department of Health, the Area Health Board and the local authority as appropriate shall be obtained. Chemical wastes should not be passed directly to the sewage system unless specific approval has been obtained from the sewage disposal authority but should be collected for treatment to meet local requirements. Expert advice shall be obtained prior to the disposal of other chemicals.

10.2.2
Hazardous chemicals
Disposal of hazardous chemicals shall be performed only by persons skilled in the necessary procedures.

NOTE - Attention is drawn to the need for storage sites to comply with the Dangerous Goods Act.

10.2.3
Segregation
Solvent wastes shall be stored and disposed of in accordance with the waste management plan (see 5.1) and:

(a) Different wastes shall not be mixed;

(b) An inventory shall be kept of the types and quantities of solvent wastes held;

(c) Containers shall have an air space of 8 mm minimum to allow for expansion of their contents.

10.3
Pharmaceutical wastes
All unused pharmaceuticals shall be returned to the supplying pharmacist for disposal.

10.4
Plastics wastes

10.4.1
The increase in the use of plastics materials necessitates special attention to enable suitable disposal methods to be used. If it is contaminated, plastics waste should be treated in line with other wastes according to the contaminant.

10.4.2
Plastics wastes shall be segregated into hazardous and non-hazardous wastes and collected accordingly into containers appropriate to the contaminant. Non-hazardous plastics wastes may be disposed of as an ordinary waste.

10.5
Asbestos wastes
Attention is drawn to the need for the disposal of asbestos waste to be in accordance with the Asbestos Regulations.

11
RADIOACTIVE WASTE

11.1
Radioactive wastes shall be disposed of as directed in NRL C1 *Code of practice for the use of unsealed radioactive materials* or as modified for medical practice by section 10 of NRL C3 *Code of practice for the use of unsealed radioactive materials in medical practice.*

12
CYTOTOXIC WASTE

12.1
Cytotoxic wastes shall be collected and handled only by persons suitably trained in handling such substances. Cytotoxic drug preparation should be in special areas, and any waste or spillage should be contained within the area prior to adequate containment and subsequent transfer for disposal.

12.2
Containers for cytotoxic materials shall meet the requirements for non-reusable hard shell containers (see 6.4). Each container shall be impervious and shall be sealed and labelled prior to leaving the work room.

12.3
Low concentration waste from patients being treated with cytotoxic preparations e.g. urine, faeces, and vomitus, should be discharged to the sewage system provided they are suitably diluted. The approval of the local sewage disposal authority should be obtained.

12.4
Any cytotoxic waste mixed with other waste shall be treated as cytotoxic waste e.g. cytotoxic spills cleaned up with absorbents, either in the drug preparation area or the treatment area.

12.5
Containers shall be colour coded and shall have a

symbol indicating cytotoxic waste. See Appendix B.

NOTE - The Department of Health's *Guidelines for the parenteral administration of cytotoxic agents* gives safe working methods for handling cytotoxic agents.

13
TRANSPORTATION ON PUBLIC ROADS

13.1
The segregation methods and identification as indicated herein shall be applicable for all wastes. If wastes from home treatment involve special collection then the same segregation and identification system shall be used. Transportation systems shall set and maintain high standards and the requirements of NZS 5433 shall be complied with.

13.2
Vehicles should preferably be reserved specifically for the transportation of wastes. They shall be easily cleaned, loaded and unloaded. Any accidental spillage shall be contained within the waste containment area of the vehicle.

13.3
The driver shall be physically isolated from the load.

13.4
The vehicle design shall be such that in the event of an accident it will afford the best practical means of avoiding danger to the general public and to the driver, from the wastes being transported.

13.5
All vehicles shall prominently display the symbols necessary to indicate the type of waste being transported.

13.6
Only in exceptional circumstances e.g. when qualified staff are taking small amounts of waste to a central disposal facility may ordinary vehicles be used. The wastes, suitably labelled and identified, shall be sealed in special containers.

13.7
Vehicles shall be cleaned as per 7.2.1 after each use.

14
TREATMENT PRIOR TO DISPOSAL

14.1
General
In some cases, it may be practicable to pretreat the wastes so as to render them innocuous and thereby dispose of them as general waste. For some highly infectious materials, and pathological wastes, pre-treatment may be necessary before they are acceptable for disposal. Such treatment is generally expensive and should be reserved for wastes that cannot be disposed of economically or safely in any other way. If special waste has been subject to pre-treatment so as to render it innocuous it may be treated as a general waste.

14.2
Autoclaving

14.2.1
Autoclaving or steam sterilization shall be carried out in accordance with the *Code of practice for steam sterilization* issued by the National Health Institute.

14.2.2
Materials to be autoclaved prior to disposal shall be segregated and placed in special bags, unless the autoclaving procedure allows the waste material to be spread on trays in an open manner. Autoclave bags shall be able to resist the high temperatures necessary and shall have high permeability to steam to allow complete sterilization. The cycle of operation for the autoclaving shall be recorded and kept with the disposal records of wastes that require such treatment. Care shall be taken to ensure that the procedure achieves decontamination throughout the entire thickness of the waste.

14.2.3
Wastes which have been rendered completely innocuous by autoclaving treatment may enter the general waste disposal stream. However wastes which are visually offensive may need to be macerated or otherwise treated before disposal.

14.3
Maceration

14.3.1
Certain special wastes e.g. certain disposables, may need to be macerated before being discharged to the sewer.

14.3.2
If maceration or low speed disintegration is used to allow special wastes to be discharged to the sewer the design of the equipment should be such as to allow the wastes to be dealt with as soon as they arrive on site. Storage space shall be provided to accept the wastes and such storage shall comply with 6.2.

14.3.3
The design and operation of the macerator shall be such as to minimize the production of aerosols and the possibility of blockage.

14.3.4
All precautions shall be taken to prevent foreign objects which reduce the efficiency of maceration, from being put in the waste stream destined for maceration.

Table 3
RECOMMENDED METHOD OF DISPOSAL

Type of waste	*Classification of waste*	*Preferred method of disposal*	*Other options*
General	Ordinary	Landfill	Incineration
	Glass	Landfill	Recycle
	Kitchen - dry	Landfill	Incineration
	Kitchen - wet	Landfill or recycle	Incineration
	Plastics (non-contaminated)	Landfill or recycle	Incineration
Special	Identifiable anatomical	Incineration	None
	Biohazardous (except plastics)	Incineration	Pre-treatment to render non-hazardous followed by landfill (See 14.1)
	Chemical	See 10.2	
	Pharmaceutical	See 10.3	
	Plastics (contaminated)	Incineration	
Radioactive	All waste	See 11.1	None
Cytotoxic	All waste	Incineration	None

14.4
Other sterilization methods
It is possible that other methods of sterilization and pre-treatment are suitable (e.g. ethylene oxide or radiation treatment) but these are expensive and require highly skilled operation. They should only be considered after a full evaluation and approval by the Department of Health.

15
WASTE DISPOSAL

15.1
General
The methods used for waste disposal will depend on local circumstances and facilities. Local authorities shall be consulted to ensure that the waste disposal method is appropriate to the facilities in the area. Recycling should be considered where feasible but only where there is no danger to health or environmental quality.

15.2
Incineration

15.2.1
For the majority of special wastes incineration is the preferred disposal method and particularly for those wastes as indicated in table 3. General wastes may also be incinerated depending on the volume of waste generated and the economic aspects of the total operation.

15.2.2
Incinerators shall comply with the requirements of the Clean Air Act and its successors.

15.2.3
Site facilities
The incinerator shall be housed in an area such that waste delivery, incinerator loading, and residue removal can be easily and efficiently carried out. The reception area shall be of sufficient capacity to collect the wastes and shall be divided into spaces to maintain their segregation and to help ensure subsequent equilibrium charging of the incinerator. Waste shall be moved or transported to the incinerator site from pre-disposal storage areas or waste holding areas in suitable non-returnable containers.

15.2.4
Storage
Wastes shall be stored in a secure, well ventilated room which has graded and drained flooring, smooth impervious walls and washable ceiling and

which is easily accessible to vehicles. Tissue and other putrescible wastes should be burned immediately and in any case shall be burned the same day they are received. All wastes shall be stored at the incinerator site for as short a time as possible. An emergency procedure should be established for disposal at other sites or by other means in the event of the incinerator being out of action for two or more days.

15.2.5
Operation
The incinerator shall be capable of accepting waste of widely ranging calorific values and which may include a large proportion of plastics material. The incinerator should have a mechanical or automatic feeding device but the device shall not cause the bags of waste to break open within the charging system. All combustion off-gases shall be retained in the presence of excess air and in a turbulent condition within the final combustion chamber at a temperature of not less than 1000 °C for a minimum time of 1.0 s. Dust extraction equipment may be needed, as also may a flue gas scrubber if large amounts of chlorinated plastics are to be burnt. The installation shall be controlled in such a manner as to ensure a completely fail safe operation. Alarms shall be fitted to indicate when the combustion cycle has not been correctly completed.

15.2.6
Disposal of residue
The removal of residue from the incinerator shall be easily accomplished. Receptacles and handling facilities shall be provided to eliminate danger to the operators from incombustible substances in the ash. Vehicles must have easy access to the residue storage area. Incinerator residue may be disposed of to landfill sites.

15.3 Disposal to landfill

15.3.1
General
Health care wastes contain a large proportion of general waste which provided that adequate segregation is practised, may be sent directly to landfill. Not all waste generated in health care facilities however is suitable for direct disposal at landfill sites. See table 3 for wastes which may be disposed of at landfill sites.

15.3.2
Transportation
Vehicles for transportation to landfill sites shall comply with 13.2 to 13.7 inclusive. Wastes for landfill site disposal shall be transported directly to the site from the pre-disposal storage area. Once it leaves the health care facility it shall not be subject to any mechanical handling or compaction which may destroy the integrity of the containers.

15.3.3
Compaction
Compactors and transportable containers may be used to increase the efficiency of waste disposal to landfill sites. The compactors should be situated at the pre-disposal areas. If special wastes are compacted along with general wastes then the whole of the compacted volume shall be treated as special waste of the type added to the general waste.

15.3.4
Landfill sites
Where incineration is not available landfill sites for special wastes shall be authorized by the Area Health Board or by the Regional Waste Management Plan as suitable for the disposal of special wastes. Landfill sites for special wastes shall be securely fenced and be located so that the visual impact on the general public is minimized. A record shall be kept, by the waste disposal authority of those sites which have taken special wastes.

15.3.5
Site operation

15.3.5.1
Special wastes should be deposited in cells constructed for the purpose and immediately covered with 500 mm of suitable material so as to protect them from the action of machinery working the landfill.

15.3.5.2
Special wastes arriving at the landfill site should be packaged in plastic bags or appropriate containers. The handling of such wastes should be kept to a minimum. Vehicles should be capable of discharging their load without manual handling if large quantities are delivered. If road vehicles are required to go onto the site to discharge their load they should be able to do so without running over special wastes.

15.4 Discharge to sewers

15.4.1
General
Health care wastes similar to domestic wastes which are usually discharged to sewers may also be discharged to the sewer. For other wastes which may conveniently, either directly or after suitable treatment, be discharged to the sewer, the written agreement of the local sewage disposal authority shall be obtained. Wastes which shall not be discharged to sewers include large quantities of pharmaceuticals, or waste organic solvents. The amount of wastes that can be discharged depend on the capacity of the sewage treatment plant. In the design of a new facility the sewage disposal authorities shall be consulted early if the discharge to the sewer is to be considered as a disposal option.

APPENDIX A
WASTE ASSESSMENT - SPECIAL WASTE

A1
Waste is classified as special waste if it:

(a) Contains prescription only medicine;

(b) Contains hazardous chemicals;

(c) Contains material having a flash point of 21 °C or less;

(d) Contains a known, or probable, human carcinogen at 1 % or more concentration;

(e) Is likely to cause serious tissue damage on exposure for a period of up to 15 mins;

(f) Ingestion of up to 500 mL is likely to cause death or serious tissue damage to a 20 kg child.

APPENDIX B
SYMBOLS FOR WASTE CLASSIFICATION

B1
SPECIAL WASTES

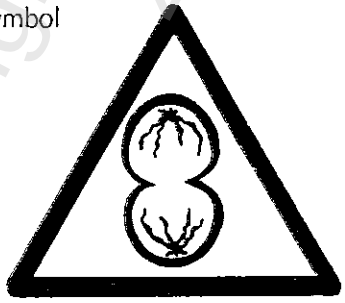
The symbol for these wastes is the internationally recognized biological hazard symbol in black:

B2
RADIOACTIVE WASTES

The symbol for these wastes is the internationally recognized ionizing radiation symbol in black:

B3
CYTOTOXIC WASTES

The symbol for these wastes is the telophase symbol in black:



COMMITTEE REPRESENTATION

This Standard was prepared under the supervision of the Building and Civil Engineering Divisional Committee (30/-) for the Standards Council, established under the Standards Act 1988.

The Health Care Waste Management Committee (4304) was responsible for the preparation of this Standard, and consisted of representatives of the following organizations:

Department of Health –
  Air Pollution Control
  Health Protection
Hospital Boards Association of New Zealand
Hotel, Hospital and Restaurant Workers Union
National Toxicology Group
New Zealand Dental Association
New Zealand Medical Association
New Zealand Nurses Association
New Zealand Nurses Union
New Zealand Private Hospitals Association
New Zealand Society of Pathologists
New Zealand Veterinary Association

Mr W McDonald was also appointed to the committee.

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	AMENDMENTS
Date of issue	*Description*

THE NEW ZEALAND STANDARD CERTIFICATION MARK SCHEME

The 'S' Mark appearing on a product, container or label is an assurance that the goods are manufactured under a system of supervision, control, and testing (including periodical inspection at the manufacturer's works by SANZ Certification Officers) designed to ensure compliance of the commodity, process, or practice with the relevant New Zealand Standard. The New Zealand Standard Certification Mark, registered as a certification trade mark under the Trade Marks Act 1953, may be used only in terms of a licence issued by SANZ, and must be accompanied by the licence number and the NZS number.

Used correctly in conjunction with advertising the 'S' Mark can provide a strong assurance of product quality for a manufacturer when selling his goods and thus becomes a powerful marketing tool.

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