

Industry Code of Practice for the Management of Clinical and Related Wastes

5th Edition



A Division of



WASTE MANAGEMENT
ASSOCIATION
OF AUSTRALIA

March 2007

ISBN 0-9580886-0-8

Revision Number Five

This work is copyright. Apart from any use as permitted under the Copyright Act 1968, no part may be reproduced by any process without permission from the Australian and New Zealand Clinical Waste Management Industry Group. Requests and enquiries concerning reproduction and rights should be addressed to the Australian and New Zealand Clinical Waste Management Industry Group Network Manager, 1st floor, 24 Thomson Street, South Melbourne Vic 3205 Australia or via email info@clinicalwaste.org

This publication can be purchased from the Waste Management Association of Australia (1300 651 026 or from outside Australia +61 2 8746 5000) or from the Waste Management Association of Australia website: www.wmaa.asn.au



Contents

PREFACE	3
STAKEHOLDERS READY REFERENCE GUIDE	4
REVIEW PROCESS	6
ACKNOWLEDGEMENTS	8
1. INTRODUCTION	18
1.1 INDUSTRY AIM	18
1.2 SCOPE	19
2. DEFINITIONS	20
2.1 INTRODUCTION	20
2.2 CLINICAL AND RELATED WASTE	21
2.3 NEW ZEALAND DEFINITION	22
3. COMMUNITY RELATIONS	23
3.1 RIGHT TO KNOW (COMMUNITY)	23
3.2 MEDIA	24
4. HOME HEALTHCARE WASTE	25
4.1 HOME HEALTHCARE WASTE ISSUES	25
4.2 MANAGEMENT OF HOME HEALTHCARE WASTE	26
4.3 MANAGEMENT OF HOME HEALTHCARE WASTE - SELF CARE	28
5. WASTE MINIMISATION	29
5.1 WASTE MANAGEMENT PLANS	29
5.2 WASTE AUDITS	29
5.3 WASTE MINIMISATION	30
6. MANAGEMENT RESPONSIBILITIES	31
6.1 WASTE GENERATORS' RESPONSIBILITIES	31
6.2 WASTE TRANSPORT/DISPOSAL COMPANIES'	33
RESPONSIBILITIES	33
6.3 WASTE HANDLING TECHNIQUES	34
7. WASTE CONTAINMENT	36
7.1 SOURCE SEGREGATION	36
7.2 CONTAINERS AND PACKAGING	37
7.3 CONTAINER LABELLING	38
8. STORAGE REQUIREMENTS	41
8.1 GENERAL STORAGE REQUIREMENTS	41
8.2 STORAGE REQUIREMENTS	42
9. TRANSPORTATION	44
9.1 TRANSPORT VEHICLES/CONTAINERS	44
9.2 APPROVALS	46
9.3 VEHICLE OPERATION	46
9.4 VEHICLE SIGNAGE	47
9.5 WASTE TRANSPORT CERTIFICATES	48
9.6 ACCREDITED AGENCY SYSTEM	49
9.7 TRANSBOUNDARY TRANSPORTATION OF CLINICAL AND	50
RELATED WASTE	50

9.8	RAIL TRANSPORTATION	50
9.9	AIR TRANSPORTATION	50
9.10	MARINE TRANSPORTATION	50
10.	TREATMENT AND DISPOSAL FACILITIES	51
10.1	SITING AND DEVELOPMENT OF TREATMENT FACILITIES	51
10.2	CLINICAL AND RELATED WASTE TREATMENT AND DISPOSAL METHODS	52
10.3	WASTE TREATMENT AND DISPOSAL METHODS	53
10.4	EQUIPMENT AND FACILITY DESIGN AND CONSTRUCTION	53
10.5	EMISSION STANDARDS	54
10.6	OPERATIONS MANAGEMENT	54
10.7	WASHDOWN EFFLUENTS	55
10.8	OPERATIONAL RECORDS	55
10.9	PROCESS MONITORING AND RECORDING	56
10.10	PROCESS INSTRUMENTATION AND CONTROL	56
10.11	SAMPLING	57
10.12	OTHER CONDITIONS	57
10.13	MICROBIAL TESTING	58
10.14	WASTE CONTROL DOCUMENTATION	58
11.	DISPOSAL OF TREATMENT RESIDUES	60
11.1	RESIDUE DISPOSAL	60
11.2	STORMWATER MANAGEMENT	61
12.	OCCUPATIONAL HEALTH AND SAFETY	62
12.1	OCCUPATIONAL RISK AND MANAGEMENT	62
12.2	MANAGEMENT RESPONSIBILITY	65
12.3	EMERGENCY/CONTINGENCY PLANS	66
12.4	COMPLIANCE	68
13.	EDUCATION AND TRAINING	69
13.1	EMPLOYEES	69
13.2	EMPLOYEE TRAINING	69
13.3	THE TRAINING PROGRAM	70
13.4	TRAINING METHODS	71
13.5	ASSESSMENT	71
13.6	TRAINING SCHEDULE	72
13.7	INSTRUCTORS AND INSTRUCTIONS	72
13.8	RECORD KEEPING	72
13.9	WASTE TREATMENT OPERATOR TRAINING	72
APPENDIX ONE:	74
	Clinical and Related Waste Treatment Processes in Use in Australia and New Zealand	74
APPENDIX TWO:	82
	Licence Conditions for Clinical and Related Waste Treatment Techniques in Australia and New Zealand	82
APPENDIX THREE:	84
	Sample Waste Management Plan	84
APPENDIX FOUR:	85
	State/Territory Regulatory Agency and other Relevant Websites	85
APPENDIX FIVE:	87
	Signatory Organisations to the Code as at March 2007	



Preface

The goal of this Code of Practice is the voluntary commitment by the members of the Australian and New Zealand Clinical Waste Management Industry Group (ANZCWMIG) to *Environmental Best Practice* in the safe and cost effective, transportation, treatment and disposal of clinical and related waste. Where practicable, this Code of Practice is outcome focused rather than prescriptive so as to assist progress towards Environmental Best Practice for the industry, irrespective of the treatment and/or disposal technologies used.

This Code is by no means a stand-alone document. Reference to requirements found in each jurisdiction's workplace health and safety, dangerous goods, hazardous facilities, public health and safety, environmental protection legislation and other relevant Codes of Practice and Guidelines is recommended to ensure that the Clinical Waste Industry manages the transport, treatment and disposal of clinical and related waste in an environmentally acceptable and safe manner.

The ANZCWMIG recognises that to effectively manage clinical and related waste, consideration needs to be given to: generation and minimisation; source segregation; identification and labelling; handling and storage; transportation; treatment; disposal of residues (including emissions); occupational health and safety; public and environmental health; stakeholder and community awareness and education; and the research and development into improved technologies and environmentally sound practices.

Good environmental practices, that this Code promotes, will assist in the achievement of a sustainable society. This will require the implementation of continual improvement programs to ensure clinical and related waste is managed safely and effectively. ANZCWMIG encourages the implementation of best-practice options for the management of clinical and related waste.

This Code focuses primarily on those areas which are directly relevant to the ANZCWMIG members. It is anticipated that other sectors of the industry will use this document as a means of revising and improving their operations so as to assist ANZCWMIG members to provide safe, cost effective and environmentally responsible services to the Healthcare Industry.

This Code has been developed by the ANZCWMIG. Extensive consultation between ANZCWMIG and Government departments of environment and health and other national associations with a role in the manufacture or generation of clinical and related waste has occurred during the initial preparation, and subsequent reviews of this Code. It is anticipated that these stakeholders will continue to assist and support Industry by providing ongoing feedback and through recognition of Industry members of ANZCWMIG who work to the Code.

The Code is subject to regular review in the light of advice received from industry and regulatory agencies. Such updates allow for the introduction of new technologies and practices. This Code will be reviewed every two years.

Stakeholders Ready Reference Guide

The Code has been structured to provide advice and standards for all stakeholders involved in the generation, storage, transport, treatment and disposal of clinical and related waste. The following provides a ready reference to those specific Sections applicable to each main participant in the management of clinical and related waste:

Generators

- Introduction – Section 1
- Definitions – Section 2
- Community Relations – Section 3
- Home Healthcare Waste – Section 4
- Waste Minimisation – Section 5
- Management Responsibilities – Section 6.2, 6.3
- Waste Containment – Section 7
- Storage Requirements – Section 8
- Occupational Health and Safety – Section 12
- Education and Training – Section 13
- Sample Waste Management Plan – Appendix 3

Storage Facilities

- Introduction – Section 1
- Definitions – Section 2
- Community Relations – Section 3
- Management Responsibilities – Section 6.1, 6.3
- Waste Containment – Section 7
- Storage Requirements – Section 8
- Occupational Health and Safety – Section 12
- Education and Training – Section 13

Transporters

- Introduction – Section 1
- Definitions – Section 2
- Community Relations – Section 3
- Home Healthcare Waste – Section 4
- Management Responsibilities – Section 6.1, 6.3
- Waste Containment – Section 7
- Transportation – Section 9
- Occupational Health and Safety – Section 12
- Education and Training – Section 13

Treatment Facilities

- Introduction – Section 1
- Definitions – Section 2
- Community Relations – Section 3
- Management Responsibilities – Section 6.1, 6.3
- Waste Containment – Section 7
- Treatment and Disposal Facilities – Section 10
- Disposal of Treatment Residues – Section 11
- Occupational Health and Safety – Section 12
- Education and Training – Section 13



Review Process

This is the fifth edition of the ANZCWMIG Industry Code of Practice for the Management of Clinical and Related Waste. The review process for the Code involves the current edition of the Code being forwarded to the following organisations to seek their comments on the content of the Code:

- Australian Association of Pathology Practice
- Australian Council of Trade Unions
- Australian Dental Association
- Australian Healthcare Association
- Australian Infection Control Association
- Australian Medical Association
- Australian Nursing Federation
- Australian Private Hospitals Association
- Australian Society of Microbiology
- Australian Veterinary Association
- Dental Facilities
- Department for Administrative and Information Services – Workplace Services (SA)
- Department of Industrial Relations – Workplace Health and Safety (QLD)
- Department of Infrastructure, Energy and Resources – Workplace Standards (Tas)
- Environment Institute of Australia and New Zealand
- Environment Victoria
- General Practitioners
- Government Environment Protection Agencies
- Government Health Departments

- Healthcare Facilities
- Infection Control Practitioners Association of Queensland
- Institute of Hospital Engineering Australia
- Kimberly-Clark Australia
- National Environment Protection Council
- National Health & Medical Research Council
- Royal District Nursing Service
- Standards Australia
- The Australian Council on Healthcare Standards
- Victorian Waste Management Association
- Waste Management Association of Australia
- Waste Management Institute of New Zealand
- WorkCover NSW
- WorkSafe Victoria

All comments received are then debated at length and, where deemed appropriate by a vote of ANZCWMIG members, amendments made to the Code to reflect these comments.

Date of Last Review – March 2007

Date of Next Review – March 2009

Acknowledgements

The development of the Code of Practice was funded by ANZCWMIG (a Division of Waste Management Association of Australia), and is a reflection of the Industry's commitment to maintaining and improving environmental performance. The practical assistance and input from members of the ANZCWMIG in reviewing and revising drafts is acknowledged.

The time taken by so many to read and provide constructive comment and advice on the Code is appreciated.

This Code is based on principles or information derived from the following sources:

1. Australian Standards, AS: 3816. Management of Clinical and Related Wastes, June 1998.
2. Australian Standards, AS: 4031. Non-reusable Containers for the Collection of Sharp Medical Items used in Healthcare Areas, 1992.
3. Australian Standards, AS/NZS: 4261. Re-usable Containers for the Collection of Sharp Items in Human and Animal Medical Applications, 1994.
4. Australian Standards, AS/NZS: 4478. Guide to the Reprocessing of Reusable Containers for the Collection of Sharp Items used in Animal Clinical/Medical Applications, 1997.
5. NHMRC - National Guidelines for Waste Management in the Health Care Industry, 1999.
6. World Health Organization - Safe Management of Wastes from Health-Care Facilities, 1999.
7. New Zealand Standards NZS4304:2002 Management of Healthcare Wastes.
8. New Zealand Standards NZS5433:1999 Transport of Dangerous Goods on Land.
9. New Zealand Land Transport Rule, Dangerous Goods 1999, Rule 45001


Note: The NHMRC - National Guidelines for Waste Management in the Health Care Industry, 1999, has been rescinded.

As of the date of publication of this 5th Edition, a joint committee of Standards Australia and Standards New Zealand is still conducting reviews of the following Standards:

- Australian Standards, AS/: 3816. Management of Clinical and Related Wastes, June 1998.
- Australian Standards, AS: 4031. Non-reusable Containers for the Collection of Sharp Medical Items used in Healthcare Areas, 1992.
- Australian Standards, AS/NZS: 4261. Re-usable Containers for the Collection of Sharp Items in Human and Animal Medical Applications, 1994.

In addition, progress on the Risk Based Clinical Waste Definition project has not been finalised.

Once the reviews of the above Australian Standards are complete and the revised Standards published, any necessary amendments to this edition of the Code of Practice will be circulated.



Clinical and Related Waste Management - Glossary of Terms and Definitions

Term	Definition and Source
Additional Precautions	Precautions used for patients known or suspected to be infected or colonised by highly transmissible pathogens that can be transmitted by airborne, droplet or contact transmission. Additional precautions are designed to interrupt transmission of infection by these routes and should be used in addition to Standard Precautions when transmission of infection might not be contained by using standard precautions alone. See Standard Precautions.
Air Pollution	The presence of material/substance in air which may be harmful to either the natural or human environment, which includes any material present in sufficient concentrations for a sufficient time, and under certain circumstances to interfere significantly with the comfort, health or welfare of persons, or with the full use and enjoyment of property (Compendium of Solid Waste Management Terms and Definitions, 5:1991 and Australian/New Zealand Standard Waste Management Glossary of Terms).
Air Quality Standards	The level of pollutants by law that cannot be exceeded during a specified time in a defined area (Compendium of Solid Waste Management Terms and Definitions, 5:1991 and Australian/New Zealand Standard Waste Management Glossary of Terms).
Anatomical Waste	Limbs, organs, placenta, pathological specimens, biopsy specimens and body tissue taken during laboratory testing, surgery or autopsy and/or resulting from investigation or treatment of a patient. It does not include corpses.
Animal Waste	Tissue arising from the whole or any part of an animal or excreta taken or collected during surgery or laboratory research or testing.
Autoclave	A vessel designed to sterilise materials by exposing them to steam under pressure.

Term	Definition and Source
Biochemical Oxygen Demand (BOD)	A measure of the amount of oxygen used by micro-organisms to breakdown organic waste materials in water (Compendium of Solid Waste (BOD) Management Terms and Definitions, 10:1991 and Australian/New Zealand Standard Waste Management Glossary of Terms).
Body Parts	Refer to definition of Anatomical Waste. In New Zealand – Human or Animal body parts, tissue, and/or organs, inclusive of foetuses and placentae.
Bunding	A secure wall, ridge or depression of sufficient integrity to completely contain liquid within, or run-off from, waste stored within its confines (AS/NZS: 3816:1998 - Management of Clinical and Related Wastes and NZS4304:2002 Management of Healthcare Waste in New Zealand).
Carbon Monoxide	A colourless, poisonous gas that has a faint metallic odour and taste. Produced during incomplete thermal degradation or microbial decomposition of organic base materials when the oxygen supply is limited; intentionally produced during some pyrolysis processes (Compendium of Solid Waste Management Terms and Definitions, 15:1991 and Australian/New Zealand Standard Waste Management Glossary of Terms).
Chemical Oxygen Demand (COD)	Measure of the oxygen equivalent of the organic matter in a sample of sewage, liquid waste, leachate or polluted water that is susceptible to oxidation by a strong chemical oxidant (Compendium of Solid Waste Management Terms and Definitions, 16:1991 and Australian/New Zealand Standard Waste Management Glossary of Terms).
Chemical Waste	Chemical waste generated by the use of chemicals in medical, veterinary and laboratory procedures. Chemical wastes in this category include, but are not limited to, mercury, cyanide, azide, formalin and gluteraldehyde (NHMRC Guidelines, 15:1999). Chemical wastes also include photochemical wastes.
Clinical and Related Waste	Clinical and related waste is that which has the potential to cause sharps injury or infection, and includes sharps, human tissue waste, laboratory waste, animal waste resulting from medical, dental or veterinary research or treatment that has the potential to cause disease: or any other waste, arising from any source, as specified by an appropriate infection control officer. Related wastes are defined as wastes within the waste stream, which constitute, or are contaminated, with cytotoxic drugs, chemicals or pharmaceuticals.

Term	Definition and Source
Collection	The act of removing accumulated waste from the generating source.
Container	This refers to any rigid walled receptacle designed for clinical and related waste (or other wastes) to be deposited into it. Retractable syringes are not considered sharps containers in their own right.
Contingency Plan	A document setting out an organised, planned and coordinated course of action to be followed in case of fire, explosion or other accident that releases toxic chemicals or hazardous wastes which threaten human health or the natural environment (USEPA Glossary of Terms and Acronym List, 5:1988).
Controlled Waste	Healthcare waste that is recognizable as coming from a healthcare facility which: <ul style="list-style-type: none"> (a) May be contaminated or soiled with potentially infectious human or animal body fluids which shall not be expressible under compaction; or (b) Is not infectious but may be considered culturally or aesthetically offensive.NZS4304:2002 Management of Healthcare Waste.
Cytotoxic Waste	Material, which is, or may be, contaminated with a cytotoxic drug during the preparation, transport or administration of cytotoxic therapy (NHMRC Guidelines, March: 1999).
Disinfect	To destroy pathogens but not necessarily all microbial life (Compendium of Solid Waste Management Terms and Definitions, 23:1991 and Australian/New Zealand Standard Waste Management Glossary of Terms).
Effluent	Treated or untreated liquid waste that flows out of a treatment plant sewer, or industrial outfall. Generally refers to wastes discharged into surface waters (USEPA Glossary of Terms and Acronym List, 6:1988).
Emergency	A situation created by an accidental release or spill of hazardous chemicals or infectious material, which poses a threat to the safety of workers, residents, environment or property (USEPA Glossary of Terms and Acronym List, 7:1988).

Term	Definition and Source
Employees	<p>In this document refers to the following:</p> <ul style="list-style-type: none"> (a) Those who generate clinical and related waste in the course on their duties; (b) Those who collect and move and/or transport the waste; (c) Those who handle the waste and/or operate or maintain equipment at the treatment/disposal facility; and (d) Reception and administrative staff of any organisation conducting activities under points; a, b and c.
ETD	<p>Electro Thermal Deactivation (ETD) is a process for grinding medical waste after which an oscillating energy field of low frequency radio waves is used to heat the waste to temperatures that destroy pathogens such as viruses, vegetative bacteria, fungi and yeast without melting the plastic content of the waste.</p>
Exposure Limits	<p>The amount of radiation or pollutant present in a particular environment (ie. human, natural) that represents a potential health threat to the living organisms in that environment (USEPA Glossary of Terms and Acronym List, 7:1988).</p>
General Waste	<p>Any waste (excluding recyclable materials), not classified as being within any of the categories of the clinical and related waste streams.</p>
Generators	<p>You are a generator of clinical and related waste if you generate any waste materials that are defined in Section 2 of this Code. In particular, you are considered a generator if you are subject to relevant legislation in each jurisdiction in regards to the management of clinical and related waste and/or providing services on a professional basis that result in the production of what has been defined as clinical and related waste. Examples of generators include:</p> <ul style="list-style-type: none"> (a) Hospitals and their associated departments; (b) Clinics operated by physicians and dentists, dialysis centres, drug treatment centres, maternity clinics, thrombosis clinics and community health centres; (c) Healthcare facilities such as nursing homes; (d) Support services such as blood banks, pharmacies, medical/teaching centres, mortuaries, laundries and laboratories (clinical, pathology, haematology, chemistry and research including veterinary and genetic);

Term	Definition and Source
Generators cont...	(e) Other clinical and related waste generators as specified by each jurisdiction (e.g. brothels, body piercing organisations, professional home health-care organisations); and (f) Professionals providing home healthcare, or homecare patients generating clinical or related waste.
Healthcare Facilities	Generators of clinical and related waste such as hospital, medical, nursing, dental, pharmaceutical, or similar practices.
Health Industry Wastes	All types of wastes (clinical, related, controlled, hazardous and general) arising from medical, nursing, dental, veterinary, pharmaceutical, or similar practices, and wastes generated in hospitals or other facilities during the investigation or treatment of patients or in research projects (NH&MRC Guidelines, March: 1999).
Infectious Waste	Substances known to or reasonably expected to contain pathogens.
Jurisdiction	Refers to any area such as a Commonwealth, National, State, Territory or Local Government, which is responsible for specific legislation that may impact on the management of clinical and related waste.
Landfill	A waste facility used for the purpose of disposing of waste to land (NSW EPA Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes, 115:1999).
Leachate	Liquid that has percolated through a material mass and has dissolved or suspended microbial constituents in the liquid emanating from it (Compendium of Solid Waste Management Terms and Definitions, 41:1991 and Australian/New Zealand Standard Waste Management Glossary of Terms).
Liquid Wastes	Any waste material that is determined to contain “free liquids” - liquids that readily separate from the solid portion of waste under ambient temperature and pressure (Compendium of Solid Waste Management Terms and Definitions, 41:1991 and Australian/New Zealand Standard Waste Management Glossary of Terms).
MGB	Mobile Garbage Bin.
Microwave Treatment	The application of microwave energy via microwave units, to achieve disinfection temperatures.

Term	Definition and Source
Monitoring	Periodic or continuous surveillance or testing to determine the level of compliance with statutory requirements and/or pollutant levels in various media or in humans, animals, and other living things (USEPA Glossary of Terms and Acronym List, 11:1988 and Australian/New Zealand Standard Waste Management Glossary of Terms).
Needle Stick Injury	Refer to Sharps Injury.
Nitrogen Oxide	Product of combustion from transportation and stationary sources and major contributor to the formation of ozone in the troposphere and acid deposition (USEPA Glossary of Terms and Acronym List, 13:1988).
Non-combustibles	The components of a material which remain after combustion of all combustible matter; these include inert materials such as glass, dirt, sand and wholly oxidised metals (Compendium of Solid Waste Management Terms and Definitions, 47:1991 and Australian/New Zealand Standard Waste Management Glossary of Terms).
Occupationally Acquired Infection	Infection that was acquired as a result of an injury or exposure that was work related.
Off-site Facility	A clinical and related waste treatment, storage or disposal facility that is located away from the generating site.
On-site Facility	A clinical and related waste treatment, storage or disposal facility that is located on the generating site.
Pathology Waste	Includes pathological specimens, biopsy specimens and tissue taken during surgery or autopsy.
Pharmaceutical Waste	Consists of pharmaceutical (drug, remedy/medicinal substance) or other chemical substance specified in the Poisons List under the Poisons and Therapeutic Goods Act 1996. Pharmaceutical waste, excluding cytotoxics, may arise from expired or discarded pharmaceuticals, those no longer required by patients or departments and waste materials/substances generated during the manufacture and administration of pharmaceuticals (NHMRC Guidelines, March:1999).
Recyclables	Those materials that can be segregated from the waste stream for processing into a useful material.

Term	Definition and Source
Residual Wastes	Those materials (solid or liquid) which still require disposal after the completion of a treatment or resource recovery activity, e.g., slag and liquid effluents following a pyrolysis operation, plus the discards from front-end separation systems (Compendium of Solid Waste Management Terms and Definitions, 57:1991 and Australian/New Zealand Standard Waste Management Glossary of Terms).
Resource Recovery	A process that recovers value from the waste stream in the form of material or energy.
Sanitary Landfill	A landfill that provides for an engineered method of disposing of solid waste on land in a manner that protects the environment, e.g. by spreading the waste in thin layers, compacting it to the smallest practical volume, and covering it with soil by the end of each working day, constructing barriers to infiltration and evacuating the gases produced (NZS4304:2002 Management of Healthcare Waste).
Sanitised	To clean so that there are no pathogens present.
Secure	In relation to containers, this means that the container is positioned in such a manner that prevents the container from overturning during transit. This could also refer to ensuring that all lids of any containers are closed so that any waste material located in the containers is impeded from spilling out. Secured in this sense does not refer to leakproof. In relation to storage areas, this refers to ensuring that there is a mechanism that does not allow any unauthorised person to enter the storage area.
Segregation	Separation of the various waste components, at the point of generation, into their relevant waste stream categories for subsequent containment, transportation and disposal.
Sewer	Underground pipes that carry off only domestic or industrial wastes, not stormwater (USEPA Glossary of Terms and Acronym List, 16:1988).
Shall	Refers to a mandatory requirement.
Sharps	Objects or devices having sharp points or protuberances or cutting edges capable of cutting or piercing the skin or the container in which they are packaged.
Sharps	Percutaneous injury with any sharp designed for use in healthcare

Term	Definition and Source
Injury	(or other material that can act similar to a sharp e.g., broken glass), which may potentially transmit infectious agents and in particular blood borne viruses. Sharps may or may not have been used on a patient. See also Occupationally Acquired Infection. Sharps injury includes needle-stick injury.
Should	Refers to a recommended requirement.
Standard Precautions	Standard precautions are work practices required to achieve a basic level of infection control and should be adopted for all contact with clinical and related waste. Standard precautions are designed to reduce the risk of transmission of pathogens from blood and all body fluids (whether or not they contain blood), and all mucous membranes. Standard precautions are the primary strategy for successful nosocomial infection control. Standard precautions include: <ul style="list-style-type: none"> (a) Personal hygiene practices, including hand hygiene (b) Use of personal protective equipment (e.g., gloves, gowns, plastic aprons, masks, eye shields or goggles) (c) Appropriate handling and disposal of clinical and related waste, including sharps (d) Environmental controls, including cleaning and spills management (See also Additional Precautions.)
Sterilisation	The complete elimination or destruction of all forms of microbial life, including highly resistant bacterial endospores.
Transfer Station	A facility where unwanted materials can be taken for subsequent transport to recycling operations or landfill.
Waste Minimisation	The application of activities such as waste avoidance, reduction, re-use and recycling to minimise the amount of waste that requires disposal (Australian and New Zealand Standard Waste Management Glossary of Terms).
Waste Segregation	The process of keeping individual waste types apart during handling, storage (interim storage), and transport and to assist resource recovery and ensure appropriate designated treatment and/or disposal methods are utilised.

1. Introduction

The safe management of clinical and related waste is essential for occupational, community and environmental health. It is also important that, irrespective of technologies used for treatment and disposal, the standards of environmental and human health performance are uniform across the industry. This ensures a more viable and efficient industry.

All generators and persons involved in the management and disposal of clinical and related waste shall have appropriate management systems in place to ensure that all such wastes are managed in accordance with all applicable legislative requirements and the criteria specified in this Code. This should involve the use of an on-site treatment facility or the use of private facilities located off-site. Ensuring that contractors are meeting their requirements under this Code will assist all generators to meet environmental protection and occupational health and safety due diligence requirements.

1.1 INDUSTRY AIM

It is intended that this Code of Practice be outcome focused rather than prescriptive so that it assists progress towards Environmental Best Practice for the industry irrespective of the treatment and/or disposal technologies used. It has not been practicable to produce a Code which is completely non-prescriptive.

Mission Statement for Industry

“To achieve consistency of industry practice through uniform guidelines on classification, handling, transportation, treatment and disposal of clinical and related waste in Australia and New Zealand. In achieving this, the waste generators, transporters, disposal and treatment facilities, along with the regulators of this industry, have a focused understanding of, and commitment to, the best practice required to ensure cost effective, safe and environmentally sound management of clinical and related waste.”

ANZCWMIG supports the adoption of a structured Environmental Management System as the framework for the development and implementation of environmental management for the clinical and related waste industry.

Signatories to the Code volunteer to meet the following commitments and principles:

COMMITMENTS

Signatories to the Code voluntarily commit to the following:

- Application of the Code wherever the signatory operates and manages clinical and related waste;
- Implementation of the Code principles to all clinical and related waste services;
- Development and implementation of an audit tool to measure compliance with the requirements of the Code;
- Promotion of the Code to all stakeholders relevant to the management of clinical and related waste; and
- Progress towards adoption of best-practice management of clinical and related waste within the signatories operations and the industry sector.

PRINCIPLES

Signatories to the Code commit to conduct their operations in relation to the management of clinical and related waste within the following principles:

- Accepting social and environmental responsibility for all actions;
- Minimising environmental, social and health and safety impacts of our operations;
- Adopting an approach to management of clinical and related waste that is based on continual improvement and not just legislative requirements;
- Education of all stakeholders to minimise impacts from the management of clinical and related waste;
- Encouraging openness and transparency in all activities; and
- Improvement of accountability through greater communication with the wider community.

In order to satisfy the wider community that signatories to the Code are meeting their obligations, audit tools have been developed and are required to be implemented.

1.2 SCOPE

This document is concerned with the following areas of clinical and related waste management: generation; segregation; classification and labelling; handling; storage; transportation; treatment and disposal; disposal of residues (including emissions); occupational health and safety; public health; stakeholder and community awareness and education; and research into and development of technology and environmental best practice.

This document does not provide advice for the management of radioactive waste. Generators are advised to contact the relevant government organisation for correct advice for the management of radioactive waste generated from healthcare and similar sources.

2. Definitions

2.1 INTRODUCTION

To ensure consistency in all jurisdictions the National Health and Medical Research Council¹ and Australian/New Zealand Standards definitions of clinical and related waste have been used as the basis for the definition adopted by ANZCWMIG for this Code. This definition is:

“Wastes arising from medical, nursing, dental, veterinary, laboratory, pharmaceutical, podiatry, tattooing, body piercing, brothels, emergency services, blood banks, mortuary practices and other similar practices, and wastes generated in healthcare facilities or other facilities during the investigation or treatment of patients or research projects.”

The source of the waste must also be considered. While healthcare and similar sources are obvious generators of clinical and related waste, there are many other sources where the same precautions as specified in this Code shall also be adhered. These include (but are not restricted to), the following:

- Acupuncture clinics
- Brothels
- Collection of sharps and clinical and related waste from commercial buildings and workplaces (e.g. first aid waste)
- Collection of sharps from public areas
- Community health clinics
- Emergency services
- Funeral parlours
- Home Healthcare
- Hospital laboratories
- Local government waste collection programs
- Long Term Healthcare facilities
- Medical research facilities
- Needle exchange programs
- Pathology laboratories
- Schools
- Tattooists
- Universities
- Veterinarians

1. Note that the NH&MRC Guideline has been rescinded.

2.2 CLINICAL AND RELATED WASTE

The ANZCWMIG has in general adopted the definitions and waste classification proposed by the National Health and Medical Research Council of Australia. However, the above illustrative listing of “types” of clinical and related waste has been slightly modified.

2.2.1 This document relates to the following types of “clinical waste”:

- Discarded sharps;
- Laboratory and associated waste directly involved in specimen processing;
- Human tissue, including materials or solutions containing or contaminated with blood (including other body fluids removed during surgery, birth and autopsy);
- Animal tissue or carcasses used in research; and
- Sanitary napkins.

Reference shall also be made to the definition of Clinical and Related Waste as specified in each jurisdiction to ensure compliance with any applicable legislation. In New Zealand Clinical and Related Wastes are referred to as Hazardous and Controlled Wastes.

Reference in this document to “material contaminated with blood” refers to any contamination **and not** just free-flowing or expressible blood.

2.2.2 Related wastes are those wastes generated in a healthcare facility or similar facilities from the care or diagnosis of patients.

As the type, quantity and source of these wastes are increasing, ANZCWMIG has included the particular waste types in this Section. Related wastes include:

- Cytotoxic waste;
- Pharmaceutical waste; and
- Chemical waste.

These wastes and their current management approaches have indicated that a risk minimisation approach is required to protect the environment and the wider community. This Section applies to all waste generators.

2.2.3 Sanitary napkin waste – due to the risk associated with the manner in which these wastes are disposed of in public areas (i.e. containers used as depositories for needles), this waste shall be managed as a clinical and related waste. Generators should refer to regulatory authorities for clarification of management requirements for this waste.

2.2.4 Incontinence pads and/or nappies are not considered as a clinical or related waste unless contaminated with visible blood.

2.3 NEW ZEALAND DEFINITION

Note: In New Zealand, clinical and related waste is referred to as “Hazardous and Controlled Waste”. For this Code of Practice the term clinical and related waste means the same.

2.3.1 In addition to the above types of waste (ie. clinical and related waste in Australia), in New Zealand waste that is recognisable as coming from a healthcare facility, which:

- (a) May be contaminated or soiled with potentially infectious human or animal body fluids which shall not be expressible under compaction; or
- (b) Is not infectious but may be considered culturally or aesthetically offensive. Can be classified as Controlled waste and require pre-treatment prior to disposal at landfill.



3. Community Relations

This Section identifies:

- Types of clinical and related waste industry (e.g., generators, transporters, treatment and disposal facilities), information which should be made publicly available; and
- Some options available to the industry to better convey this information to the community.

3.1 RIGHT TO KNOW (COMMUNITY)

3.1.1 The community should be recognised as anyone (as an individual, group or organisation) who wishes to become informed of the clinical and related waste industry's activities.

3.1.2 The community has the right to information with respect to (this does not negate any rights established by applicable State/Territory legislation such as "Freedom of Information Legislation"):

- (a) Generation, handling, storage, transport, treatment and disposal activities at any clinical and related waste industry premises;
- (b) EPA (or similar agency) and Workplace and Safety (or similar agency) licences and reports;
- (c) Licenced and accidental emissions of clinical and related waste residues to any receiving environment;
- (d) Future plans for alterations, upgrading, construction or performance improvements of any clinical and related waste industry facility;
- (e) Contingency plans for emergencies;
- (f) Any health monitoring conducted at a clinical and related waste industry facility other than confidential or personal monitoring results of individual workers; and
- (g) Risk assessments, environmental audits and state of the environment reports, which are conducted for any clinical and related waste industry facility.

3.1.3 The following information shall not be divulged:

- (a) Personal details of employees including names of employees; and
- (b) Commercial and confidential information or information protected by law or by legal obligation to a third party.

3.1.4 The clinical and related waste industry members will attempt to provide relevant information to the community by methods such as:

- (a) Forming community consultation groups which have access where necessary to personnel with relevant process, technical, health and safety and environmental expertise;
- (b) Site visits, community newsletters, letter box drops and advertisement/articles in local publications (e.g. newspapers);
- (c) Promotion of the community emergency response plan for their area; and
- (d) Appointing community liaison officer(s) to establish and maintain channels of communication with the community and respond to any requests for information or complaints.

3.2 MEDIA

3.2.1 Accurate and fair coverage of any issue can be achieved by the clinical and related waste industry:

- (a) Providing accurate information in an open and frank manner;
- (b) Preparing standard media responses for areas of operation; and
- (c) Training management staff in media response techniques.

3.2.2 It is the responsibility of the organisation to provide to the community information about public hazards that have occurred as a consequence of their failure to comply with this Code. Release of such information should occur following discussion with relevant government agencies.



4. Home Healthcare Waste

This Section distinguishes between commercial and non-commercial provision of home healthcare. This Section applies to that home healthcare which is provided by medical professionals (e.g. community nurses and visiting doctors), in the course of their duties that results in the generation of clinical and related waste as well as to patients administering self care. In some jurisdictions, these wastes are not classified under applicable legislation, and as such are not subject to any controls. Therefore management of these wastes is conducted in an ad hoc manner. This Section applies to those wastes that if generated within a healthcare facility would be subject to legislative controls.

There is a clear need, and this has been encouraged by regulatory authorities and health departments, for those providing or managing home healthcare services to manage clinical and related waste in a more responsible manner. ANZCWMIG sees this as an extension of a due-diligence program towards environmental and public health and protection of staff health and safety.

It is recognised that there is a trend towards an increase in the number of patients requiring home healthcare, with the resultant procedures in the domestic setting generating significantly greater quantities of clinical and related waste.

4.1 HOME HEALTHCARE WASTE ISSUES

- 4.1.1 Every year, many thousands of sharps, syringes and significant quantities of other clinical and related waste are generated within the home healthcare setting. This also includes wastes from patients on haemodialysis (ie. under direct supervision of a healthcare professional or administering the treatment under self care).
- 4.1.2 As there is both an increase in the number of people receiving home healthcare and the diversity of the treatments provided, coupled with the generation of a greater range of therapeutic devices, there is a clear need to provide guidance on managing the clinical and related waste generated as a result.
- 4.1.3 Medical professionals are currently transporting clinical and related waste in an un-safe manner in their vehicles. Not only does this pose a significant occupational health and safety risk to those individuals in the

event of an accident, but also to those providing emergency assistance. This waste is generally not properly contained and labelled, and poses a risk to those who handle the waste or may come into contact with the waste.

- 4.1.4 This waste if not transported with due care can cause environmental and health & safety impacts to family members, the community, waste handlers and emergency response personnel, if not managed in the same manner as for similar wastes generated within healthcare facilities.

4.2 MANAGEMENT OF HOME HEALTHCARE WASTE

This Section applies to those who provide home healthcare on a professional basis. While the patient is under the care of professional healthcare providers and clinical and related waste is generated due to the direct care of the healthcare professional, then this waste shall be managed in accordance with this Code, relevant legislation and the requirements of the facility responsible for that care.

- 4.2.1 Patients who are treated in the home may require the administration of drugs via a needle and syringe. The sharps generated shall be disposed of in the same manner as for sharps generated within a healthcare facility.
- 4.2.2 All waste items generated in the home due to the direct care of professional healthcare providers that would be classified as clinical and related waste in a healthcare facility shall be classified as clinical and related waste.
- 4.2.3 All waste collected for storage/transport/treatment by home healthcare providers shall be managed in accordance with the requirements of this Code.
- 4.2.4 Therefore, it is the responsibility of the facility/organisation employing the services of the home healthcare provider to develop a waste management plan for the waste generated as a result of the services provided. This plan shall be distributed to all relevant staff and education provided in good waste management techniques/practices. This plan shall indicate the location and operational requirements for storage/disposal facilities and identify responsible staff.

This waste management plan should be developed in consultation with local authorities to ensure that they are sufficient for the requirements set out in applicable legislation.

4.2.5 These procedures shall be followed:

- (a) Clinical and related waste collected by home healthcare providers for storage/transport/treatment/disposal off-site shall only be deposited into containers that comply with the relevant Australian/New Zealand Standard. These containers shall be an appropriately coloured and labelled container (e.g. yellow with the biohazard symbol for clinical and related waste; or purple with the telophase symbol for cytotoxic waste);
- (b) All clinical and related waste shall be deposited into a primary container, and unless the primary container used in 4.2.5(a) complies with relevant transport regulations and requirements, the primary container shall be deposited into an outer container to ensure containment of the waste and to protect all subsequent handlers of the waste;
- (c) The outer container shall be secured to prevent the escape of any waste material at all times and shall be secured in the vehicle while the vehicle is in motion so as to prevent the container moving;
- (d) Spill kits shall be available in every vehicle transporting such waste, with staff trained in their correct use; and
- (e) Records shall be kept of all wastes transported and disposed of via the home healthcare provider. These records shall include the date, type of waste, quantity and disposal pathway.

Note: Transport of clinical and related waste in a small vehicle (i.e. car), shall be undertaken so that:

- i. Waste is contained in a rigid walled container;*
- ii. All wastes are secured so that they cannot move during transit;*
- iii. Wastes are contained so that any spills cannot escape from the rigid wall container; and*
- iv. In New Zealand, transport of Class 6.2 Infectious substances, requires that all vehicles and drivers of those vehicles comply with NZS5433:1999 and Land Transport Rule 45001 with respect to load documentation, driver licensing and vehicle placarding.*

4.3 MANAGEMENT OF HOME HEALTHCARE WASTE – SELF CARE

- 4.3.1 Patients who are provided with devices to administer medications, those on home dialysis and people with diabetes shall receive instructions from the healthcare facility providing the equipment and/or treatment advice, on good waste management practices. All patients shall be encouraged to manage clinical and related waste in a safe manner.
- 4.3.2 When developing the instructions to be provided as per the above point, facilities shall consult with all relevant stakeholders such as local government, waste contractors (including domestic waste collectors), and relevant State/Territory government agencies.
- 4.3.3 It is preferred that facilities/managers providing the home healthcare assume responsibility and implement strategies that enable patients to deposit clinical and related waste at locations to facilitate correct treatment and disposal.
- 4.3.4 Patients shall be advised by the facilities/managers providing the healthcare as to the appropriate type of container that is to be used to contain the clinical and related waste - including sharps.
- 4.3.5 Patients shall be advised the facilities/managers providing the healthcare of the various options to dispose of clinical and related waste (e.g. council container exchange), and advised to not dispose of sharps and/or sharps containers in the domestic waste bin.



5. Waste Minimisation

This Section identifies and describes the importance of adopting waste management strategies based on the recognised waste management hierarchy that places waste avoidance options as preferable over waste management and treatment options.

As part of the waste management process it is important that waste generators benchmark their waste generation both internally and externally with similar facilities to ensure that progress towards correct segregation and waste minimisation is enhanced. Waste generators should be able to demonstrate their level of performance against these similar facilities and other benchmarking data.

5.1 WASTE MANAGEMENT PLANS

- 5.1.1 All generators of clinical and related waste shall employ waste management plans/protocols; conduct waste audits and implement waste minimisation policies, segregation systems and encourage resource recovery within their organisations.
- 5.1.2 Waste management companies shall also implement waste management plans to ensure that wastes are collected, treated and disposed of in a manner that strives to reduce risks to human health and to the environment.

5.2 WASTE AUDITS

Due to the inherent risks it is essential that any person undertaking waste audits be appropriately trained in safe auditing techniques and that all personnel undertaking audits shall have necessary immunisations.

- 5.2.1 Waste audits shall be conducted prior to developing or updating a waste management plan. Information acquired on waste types and quantities will assist in the implementation of successful waste minimisation practices.
- 5.2.2 All generator facilities shall use waste audits as the basis for reviewing purchasing policies, examining procedures and recommending product

substitution so as to minimise waste streams and implement safe, environmentally sound waste management practices.

- 5.2.3 All generators shall use waste audits to confirm clinical and related waste is correctly segregated and to encourage waste minimisation practices.
- 5.2.4 Organisations that undertake waste audits shall develop action plans to demonstrate improvements identified from the audit.
- 5.2.5 Waste audits shall be used to help identify appropriate wastes for effective and efficient reuse, recycling or disposal.
- 5.2.6 Waste audits shall also be conducted randomly, to ensure that only waste acceptable for a specified type of treatment/ disposal is being sent by the generator, also to ensure that clinical and related waste are not being disposed of via the general waste stream. The waste generators should be involved in the planning and conduct of these waste audits.
- 5.2.7 Results and any other relevant feedback of all waste audits shall be provided to the generator for distribution and education of staff.

5.3 WASTE MINIMISATION

- 5.3.1 When purchasing products, waste generators should assess the cost, appropriateness for the intended purpose and the product's overall contribution to the waste stream through packaging, use or disposal. Life cycle analyses should be adopted to identify where product substitutions, product changes, procedural changes and reuse/recycle strategies are more environmentally acceptable. Generators should actively implement programs that result in conserving resources and avoiding/reducing waste generation.
- 5.3.2 Factors that should be considered when assessing all products include; staff/patient safety, functionality of product, capacity to be recycled and constructed of recycled materials, costs of options for waste management (e.g., recycling versus treatment).
- 5.3.3 ANZCWMIG encourages all waste generators to approach manufacturers of clinical products and packaging to adopt practices consistent with the principles of waste avoidance and minimisation, such as;
 - (a) Reduce volume and weight of packaging and/or products without adversely affecting their use;
 - (b) Minimise packaging without compromising the safe transport and handling of the product; and
 - (c) Develop safe reusable products (without compromising patient health or worker safety).



6. Management Responsibilities

This Section identifies and describes the responsibilities of the generators, transporters and treatment/disposal companies in relation to the environmentally responsible management of clinical and related waste.

At all times it is the waste generator's responsibility to ensure that wastes are forwarded to a treatment facility that is licenced/approved to receive/treat those wastes. Advice should be sought from the relevant regulatory authorities and/or the treatment facility operator.

Both the generators and waste transport/disposal companies shall observe and comply with all regulatory control requirements enforced by the responsible jurisdictions.

ANZCWMIG does not support the use of chutes within healthcare facilities for the transport of waste.

All parties involved in any stage of the management of clinical and related waste must ensure that they are fully aware of, and comply with all specific responsibilities for the safe and effective management of these wastes.

6.1 WASTE GENERATORS' RESPONSIBILITIES

The waste generator is responsible for ensuring that all wastes are correctly segregated and appropriately packaged, labelled, stored, transported and treated/disposed of in accordance with State/Territory legislative requirements. Specific responsibilities are detailed below:

6.1.1 Generators of clinical and related waste have the responsibility for:

- (a) Ensuring institutional administrators are aware of all legal liability and ethical accountability issues relating to the production, handling and disposal of clinical and related waste;
- (b) Ensuring all clinical and related waste is properly contained;
- (c) Ensuring that due diligence procedures are implemented so that there is awareness of waste disposal pathways from point of generation to final disposal;

- (d) Ensuring that applicable licences are maintained by the generator and that all contracted waste transporters and storage/treatment/disposal facilities have current licences;
- (e) Determining that all sites receiving clinical and related wastes for treatment or disposal have operating procedures that ensure these wastes are handled and stored in accord with the requirements of all relevant legislation and Codes of Practice;
- (f) The development and implementation of waste management plans to assist to minimise waste through improved purchasing and reuse practices and to achieve cost-effective, environmentally sound source segregation, transport and treatment/disposal of all waste streams generated;
- (g) That institutional administrators ensure all relevant Occupational Health and Safety policies and procedures are pertinent and effectual and facilitate both waste segregation and minimisation procedures, without compromising staff and/or patient/client safety or care (as applicable);
- (h) Ensuring all employees are aware of, and made accountable for, their individual responsibilities in relation to waste management and to provide appropriate education and training in conjunction with a system of audits and reviews to ensure correct procedures are adhered to;
- (i) Employing all relevant measures to reduce the risk of injury to healthcare workers (staff and contract), waste industry employees and the community;
- (j) Ensuring that all relevant measures be taken to reduce environmental risks (all transport, treatment and disposal practices shall be managed in an environmentally acceptable manner to prevent contamination of groundwater, surface water, stormwater, soil and air);
- (k) Ensuring an adequate supply of the correct bins is available in all storage areas for the amount(s) of waste generated;
- (l) Nominating an individual responsible for the co-ordination of all waste management activities;
- (m) Developing and implementing a clinical and related waste training program for all staff who may generate or handle any clinical and related waste;

- (n) Including in transport, treatment and/or disposal site (as relevant), contractor contract obligations which clearly establish parameters and performance indicators that can be periodically evaluated;
- (o) Conducting regular audits of contractor's equipment and premises to ensure that wastes are managed in accordance with all legal and contractual requirements; and
- (p) Advising waste contractors should there be any variations as to types of clinical and related waste generated.

For further details refer to the appropriate Sections of this Code, and relevant standards, guidelines and local statutory requirements.

6.2 WASTE TRANSPORT/DISPOSAL COMPANIES' RESPONSIBILITIES

6.2.1 Waste transport/disposal companies are responsible for:

- (a) Notifying existing and potential clients of the intended treatment/disposal pathway for their waste;
- (b) Notification of any limitations that the proposed disposal pathway might have on the acceptance of waste from the client;
- (c) When requested, supplying an adequate number of containers which are sanitised, clearly identifiable, labelled (consistent with Sections 7.2 and 7.3) and suitable for securely containing the waste during transport and handling for storage, treatment and/or disposal;
- (d) Providing an efficient and reliable transport service to their clients;
- (e) The safe transportation of all collected clinical and related waste in dedicated and suitably equipped vehicles with relevant government approvals to licenced treatment/disposal premises;
- (f) Refusing to collect any waste container that is overflowing, obviously contains the wrong waste, wastes that are not identifiable, or which have been tampered with;
- (g) Training and supporting staff employed in the delivery of a responsible waste transport and treatment/disposal service. For further detail refer to Sections 9, 10 and 13;
- (h) Providing advice to waste generators in appropriate waste segregation;

- (i) Assisting in the conduct of waste audits and in the development of waste management plans as part of the provision of a complete waste management service (a sample waste management plan is attached in Appendix Three);
- (j) Reporting all poor generator practices as soon as practical to a representative of the generator to alert the generator to the risks associated with poor practice and to enable the generator to modify procedures if necessary;
- (k) Providing advice to generators regarding alternative management options;
- (l) Maintaining a contingency plan in case the waste cannot be collected as scheduled;
- (m) Notifying the generator if unable to collect the waste;
- (n) Assisting the treatment/disposal facility in identifying the sources and types of waste; and
- (o) Have procedures in place for the management of materials deemed not acceptable at the facility when detected.

6.3 WASTE HANDLING TECHNIQUES

- 6.3.1 All generators of clinical and related waste shall ensure their staff are trained in safe handling practices and consult the policies and procedures detailed in Sections 12 and 13 of this Code when developing standard operational procedures for their waste handlers.
- 6.3.2 For safety and risk minimisation purposes waste transport/treatment/disposal companies shall:
 - (a) Reduce human contact with clinical and related waste (e.g. by using non-manual handling techniques and not decanting waste into larger containers);
 - (b) Establish simple, standardised procedures for waste transport, treatment and disposal operations;
 - (c) Load waste directly into purpose dedicated transport vehicles for immediate transfer to a licenced treatment/disposal facility;
 - (d) Ensure that waste is safely contained during transport;
 - (e) Ensure that employees are trained in the appropriate handling of clinical and related waste (e.g. avoiding double handling of waste, spill management, identification of non-conforming waste loads);

- (f) Ensure that employees wear appropriate personal protective equipment and are trained in its correct use;
 - (g) Adhere to safe work practices outlined in Sections 12 and 13;
 - (h) Inform generators of their obligation not to undertake manual compaction of waste under any circumstances;
 - (i) Instruct generators to not undertake manual compaction of waste under any circumstances – particularly in trying to “fit” more waste into a specific container; and
 - (j) Establish procedures and reporting mechanisms to deal with spills and inappropriate storage and segregation practices.
- 6.3.3 There shall be no decanting of any clinical and related waste from one container to another.
- 6.3.4 All clinical and related waste containers removed from any premises to treat and/or dispose of the contents shall have the lid of the container secured prior to transport.
- 6.3.5 Any clinical and related waste containers that have been removed from any premises due to the need to send the contents to an approved treatment/disposal facility shall not be returned to any facility unless it has been effectively sanitised.

7. Waste Containment

This Section identifies and describes the responsibilities of all stakeholders to ensure that all clinical and related wastes are contained in appropriate containers and that manual handling of wastes is avoided.

7.1 SOURCE SEGREGATION

- 7.1.1 It is recognised that in all cases, standard precautions to prevent and or contain the spread of infectious organisms take precedence over waste management principles if procedural conflict arises. However, source segregation of wastes is usually compatible with, and supportive of, good infection control.
- 7.1.2 As part of an overall waste management program, generator facilities shall segregate their wastes at the point of generation into different waste streams to facilitate resource recovery (reuse, recycling and energy recovery), more efficient treatment, and appropriate disposal.
- 7.1.3 Waste segregation shall be practiced by both generators and waste management companies for efficient waste management.
- 7.1.4 Some treatment technologies require the use of additional bins to allow source segregation of components of the waste stream, which cannot be treated by that particular technology. Waste generators should ensure that they are aware of any waste acceptance restrictions applied to any transporter and/or treatment/disposal facility they use.
- 7.1.5 Separate bins are required for each additional waste stream (ie. recycling or resource recovery).
- 7.1.6 Sharps contaminated with cytotoxics shall be segregated from other sharps waste and shall be classified as cytotoxic waste (see Section 7.3.1 b).
- 7.1.7 All clinical and related waste outer containers shall be of the appropriate colour and have the appropriate symbol and wording printed on the container for the waste types deposited into the container.
- 7.1.8 Wastes with a high heavy metal content (as defined by the relevant State/Territory regulatory authority), shall be segregated at the waste generation point.

7.2 CONTAINERS AND PACKAGING

- 7.2.1 The correct packaging of wastes is the responsibility of the generator. However, the waste transporter should advise the generator of any problems associated with the packaging of waste.
- 7.2.2 All outer containers used for clinical and related waste shall be of a rigid design with a lid that is able to be secured and prevent spillage of the contents during transport under normal operating conditions. This container shall be designed to have a means to enable it to be easily handled or moved, and be easily identifiable by its colour and have the correct labeling and symbols for the waste type contained within. If a spill occurs from any container, then there shall be an appropriate means of containment of the spilt material.
- 7.2.3 All generator facilities shall, as a minimum:
- (a) Use containers which meet the requirements as specified by Australian/New Zealand Standards and/or Australian/New Zealand Dangerous Goods Code and/or any regulatory authority (where applicable), for each type of clinical and related waste that they generate;
 - (b) Secure and place in clearly labelled containers/liners all solid waste and sharps generated in their premises; and
 - (c) Meet any legislative requirements that are applicable.
- 7.2.4 The materials used to construct containers shall not produce emissions or residues, which persist in the environment in a manner unacceptable to the appropriate regulatory authority when disposed.
- 7.2.5 Waste generators shall use sharps containers that comply with either Australian Standards, AS: 4031. “Non-reusable Containers for the Collection of Sharp Medical Items used in the Healthcare Areas”, 1992; or Australian/New Zealand Standards, AS/NZS: 4261. “Re-usable Containers for the Collection of Sharp Items in Human and Animal Medical Applications, 1994” (Note that these two Standards are currently being reviewed).

Note: Where sharps containers require assembly, generators of sharps waste shall ensure the assembly process is such so that containers maintain their integrity during use and transport.

Personal sharps containers such as those complying with AS4939 should be managed treated and disposed of in accordance with the standards established in this Code of Practice.

- 7.2.6 Cytotoxic sharps waste shall only be deposited in disposable sharps containers that are coloured purple and contain the cytotoxic waste symbol. In New Zealand due to the lack of incineration facilities, requirements for export of cytotoxic wastes must be adhered to.
- 7.2.7 Waste transport companies shall be aware of the requirements of AS 4031: “Non-reusable Containers for the Collection of Sharp Medical Items used in the Healthcare Areas”, 1992, AS/NZS 4261: “Re-usable Containers for the Collection of Sharp Items in Human and Animal Medical Applications, 1994” and AS/NZS 4478: “Guide to the Reprocessing of Reusable Containers for the Collection of Sharp Items used in Animal Clinical/Medical Applications, 1997” with regards to containers for the transport of sharp medical items. It should be emphasised that waste transport companies who supply, collect, service for reuse or dispose of sharps containers are responsible for the implementation of occupational health and safety practices which will minimise the risk of injury to their employees. This applies during the handling, transport and disposal of full containers or their contents (in the case of reusable containers). Safe practices shall extend also to the cleaning and maintenance of reusable containers.
- 7.2.8 Waste transport companies who supply, collect, and/or service non-reusable sharps containers shall ensure compliance with Australian Standard (AS 4031:1992) “Non-reusable Containers for the Collection of Sharp Medical Items used in Healthcare Areas”.
- 7.2.9 Waste transport companies who supply, collect and/or service reusable sharps containers shall ensure compliance with Australian and New Zealand Standard (AS/NZS 4261:1994) “Reusable Containers for the Collection of Sharp Items in Human and Animal Medical Applications” and AS/NZS: 4478. “Guide to the Reprocessing of Reusable Containers for the Collection of Sharp Items used in Animal Clinical/Medical Applications”.

7.3 CONTAINER LABELLING

- 7.3.1 Correct labelling practices shall be adopted by both generator and waste transport/treatment/disposal companies. It is the waste generator’s responsibility to ensure that waste containers used to store and transport waste is appropriately labelled. The following labelling shall be used (this is also compulsory under Dangerous Goods requirements):

In Australia the following identification and labelling shall apply:

- (a) Clinical waste - All containers for clinical waste are to be marked with the international biohazard symbol in black and wording, which complies with local regulations. The words “Clinical Waste” shall be clearly displayed - Containers are to be colour coded as indicated below:



- (i) All clinical and related waste that must be incinerated is to be deposited into containers that have a yellow body, orange lid and orange liner.
- (ii) All clinical and related waste able to be treated by incineration and/or other technologies is to be deposited into containers that have a yellow body, yellow lid and yellow liner.

This requirement is in line with Australian Standard 4123.7-2006 Mobile Waste Containers Part 7: Colours, markings, and designation requirements.

- (b) Cytotoxic Waste - all containers and liners are to be purple and marked with the cell in telophase symbol in white. The words “Cytotoxic Waste” shall be clearly displayed. “Cytotoxic Waste” must be incinerated.



In New Zealand the following identification and labelling shall apply:

Table 1 - Identification of waste

Waste category / type	Colour code for container	Marking for internal facility use	Transport Label
Infectious	Yellow		
Cytotoxic	Purple		
Radioactive	Red or yellow		
All other waste	Not specified	As specified by relevant regulations	As specified in NZS 5433

7.3.2 All symbols and words are to be easily legible.

7.3.3 The following should also be included on waste container labels (the provisions of this Section do not apply in New Zealand):

- (a) 'DO NOT OVERFILL BEYOND THIS LINE' or words to that effect;
- (b) Words or a symbol to warn against placing hands in the bin or touching waste; and
- (c) Words indicating that once a container is full it shall be secured.

7.3.4 In Australia, the following should also be included on sharps containers:

- (a) Manufacturer's name or trademark;
- (b) The internationally recognised bio-hazard symbol, or where appropriate, the cytotoxic symbol;
- (c) Adequate description of contents, e.g. 'sharps', 'clinical waste';
- (d) 'DO NOT OVERFILL BEYOND THIS LINE' or words to that effect;
- (e) Assembly instruction, where appropriate; and
- (f) Words or a symbol to warn against placing hands in the container or touching contents.



8. Storage Requirements

This Section outlines minimum requirements for any storage area containing clinical and related waste (ie. centralised storage areas where wastes are consolidated). Industry standards for site, refrigeration and security needs are included as well as further specific requirements that shall be met by the storage facility.

The requirements of storage areas for clinical and related waste vary throughout Australia and New Zealand. It is therefore suggested that the relevant authority be consulted regarding these requirements. The following are indicative of the minimum requirements for Environmental Best Practice.

8.1 GENERAL STORAGE REQUIREMENTS

The following are the minimum requirements for the storage of clinical and related waste at generator facilities, transport premises and treatment/disposal facilities:

- (a) Adequate environmental protection provided;
- (b) Hygienically managed;
- (c) Suitably sited, easy to secure and have restricted access;
- (d) Signposted with the bio-hazard symbol and other labelling appropriate to the types of waste stored in the area (e.g. clinical, cytotoxic);
- (e) Safe for staff (see Section 12 for more details);
- (f) Adequately lit;
- (g) Licenced by the relevant regulatory authorities where applicable;
- (h) All containers which contain clinical and related waste are secured;
- (i) Dedicated to a clinical and related waste storage area, so that there is no mixing of these wastes with any other stored materials (e.g. supplies);
- (j) Access is limited only to authorised persons;

- (k) Storage areas secured when not in use by authorised persons;
- (l) Adequate containment measures in place (e.g. container, bund and/or sump) to prevent off-site migration of spills and provision of the necessary cleanup equipment (spill kit); and
- (m) All plastic liners shall be treated as temporary containers and shall be placed in, and remain in outer containers / bins pending transport, treatment or disposal. Plastic liners alone shall not be used for transport of the waste off-site.

8.2 STORAGE REQUIREMENTS

8.2.1 The site shall be designed and constructed so that:

- (a) Its base is an impervious surface (e.g. concrete) surrounded by a bund appropriate to contain any spill;
- (b) All loading/ unloading takes place within the bunded area in such a manner to ensure any spills are appropriately managed;
- (c) The base and walls of bunded areas are free of gaps or cracks;
- (d) Where vehicular access to the bunded area is required, bunds are constructed to prevent them from being damaged by vehicles;
- (e) Signage is posted with the bio-hazard symbol and other labelling appropriate to the types of waste stored in the area (e.g. clinical, cytotoxic);
- (f) No liquid waste, wash down waters or stormwater contaminated with clinical and related waste are disposed of via the stormwater drainage system; and
- (g) The bunded area drains to a sump or sewer to collect spills and wash waters. Cut-off drains, which drain to a sump, should be used instead of bunds if approved by the relevant authority.

Note: When a container (e.g. 240 litre yellow clinical waste mobile bin), is used as the temporary storage facility, then it should be secured in a manner to prevent unauthorised access to the contents.

Where cold storage units are hired from contractors. It is recommended that contractors of cold storage units are advised on what substances have been stored within the units, how, and whether or not they have been adequately cleaned.

8.2.2 Storage conditions include the following:

- (a) Any clinical and related waste not treated or destroyed upon arrival at a disposal premises shall be managed in a manner that

meets relevant conditions and standards so as to prevent any obnoxious odours or offence.

- (b) All refrigerator facilities shall be contained within a secure area.
- (c) Treated waste shall be segregated from untreated waste in order to ensure that cross contamination does not occur.

8.2.3 Conditions related to security of clinical and related waste include the following:

- (a) The operator shall ensure that loading/ unloading of waste is carried out in accordance with designated safe procedures, and relevant records are completed and maintained.
- (b) Containers in which clinical and related waste are stored shall be secured when loading/unloading is not taking place.

8.2.4 Spill Kits

- (a) Generator and treatment/disposal premises are required to have a spill kit located in all waste storage and/or loading/unloading areas.
- (b) A spill kit shall contain all items necessary to clean up spills of clinical and related waste. Typical contents include absorbents, disinfectant, bucket, shovel, gloves, disposable overalls, safety goggles / shield, tongs for sharps, sharps container, torch, disposable containers and plastic waste liners.
- (c) Records shall be maintained of all spills in regards to waste types, causes and corrective actions implemented.

9. Transportation

This Section outlines the requirements to ensure that transport and loading/unloading of clinical and related waste is conducted in a safe manner.

Transport of loose waste liners shall not occur. All such waste liners shall be placed into an outer container for transport – this includes for shipping containers. Transport of loose waste liners poses occupational health and safety concerns in regards to manual handling and potential environmental issues should a spill occur.

Transport of clinical and related waste shall not occur with transport of other materials unless the wastes are separated from these materials in a purpose-designed enclosure that meets the conditions contained within this Section. Clinical and related waste shall only be transported to premises licenced to accept such waste.

9.1 TRANSPORT VEHICLES/CONTAINERS

9.1.1 A vehicle used for the transport of clinical and related waste shall have the following features:

- (a) Communication equipment;
- (b) Sealed body with lockable doors (where transport time and ambient temperature factors are of an extreme nature, refrigeration of the waste compartment should be considered). In New Zealand, transport regulations (NZS5433:1999) do not require the transport vehicle of dangerous goods to have a solid sided or similar sealed body. A curtain sided or soft sided vehicle can be used. (note – the ANZCWMIG does not support the use of such vehicles and there should be a phasing in of a requirement to only use vehicles with sealed bodies);
- (c) Lifting equipment (for either mobile bins or any other container used to collect waste) to adequately lift mobile bins from the ground to load area or there is provision of ancillary equipment for lifting;
- (d) A lockable load compartment;

- (e) The load compartment physically separated from the driver's cabin by a solid partition;
- (f) Be equipped with a feature to secure bins during transport;
- (g) Appropriate personal hygiene equipment (e.g., for hand washing);
- (h) Spill kit - equipment and materials to manage a spill (e.g. absorbents, water, disinfectant, mop with disposable head, shovel, gloves, disposable overalls, safety goggles/shields (to prevent against splashes), tongs for sharps, sharps container, torch, disposal containers, plastic waste liners, labelling); NOTE: management of spills that include blood and body substances shall be undertaken in accord with the Communicable Diseases Network of Australia "Infection Control Guidelines for Prevention of Transmission of Infectious Diseases in the Health Care Setting", Commonwealth of Australia 2004;
- (i) Appropriate hazard placarding;
- (j) Detailed instructions prominently displayed in the cabin, for use in case of spills, accidents, fire or other emergencies (including records of waste types/quantities being transported and a list of contact personnel and phone numbers);
- (k) Be easy to clean;
- (l) Be rigid and leak proof;
- (m) Walls and floors of the load compartment that are smooth, impervious and have sealed seams; and
- (n) Floor of the load compartment that are banded or configured to contain spillages.

Note: Until a shipping container (or similar), has been deposited onto a transport vehicle, the container shall meet applicable storage requirements.

Consideration should be made to issues associated with transporting waste from remote communities to a central treatment facility. If alternate means of transport than road are used, then the standards detailed above shall also apply to those means (e.g., air, water, rail transport).

An effective cleaning disinfection program can be established and performed regularly (at least weekly).

9.1.2 Where an exemption from some transport requirements has been granted by the regulatory authority, the following should apply to those transporting small volume wastes in a non-dedicated vehicle:

- (a) The load compartment should be lockable and separated from the driver's cabin;
- (b) The waste material shall be contained in a manner that spillage cannot enter the load compartment, and that the container is labelled so that the type of waste material is readily identifiable;
- (c) Equipment and material should be available to manage a spill (refer Section 9.1(h));
- (d) The wastes shall be transported in such a manner that they are securely segregated from any other materials or product in accordance with the relevant Dangerous Goods code or regulation; and
- (e) Waste containers shall be secured in the load compartment during transport to prevent spillage.

9.2 APPROVALS

Relevant transport approval conditions vary for each jurisdiction in Australia and New Zealand. The relevant authorities should be contacted for a listing of their requirements.

9.3 VEHICLE OPERATION

9.3.1 The driver of a vehicle transporting clinical and related waste has a duty of care for safe operation of the vehicle and shall be:

- (a) In possession of a current relevant driver's licence and where required a dangerous goods licence and/or obtained a Hazardous Goods endorsement on their Drivers Licence;
- (b) Neat, tidy and wearing the appropriate personal protective equipment; and
- (c) Trained in spill procedures and use of spill kit equipment.

9.3.2 Drivers of vehicles used to transport clinical and related waste shall be responsible for:

- (a) Ensuring the load compartment is locked at all times when left unattended and during transport;
- (b) Safe operation of equipment;
- (c) Reporting either verbally or in writing on equipment condition daily, service failures and accidents with either vehicle or waste; and

- (d) The overall cleanliness and presentation of the vehicle under his/her control.
- 9.3.3 Owners of vehicles used to transport clinical and related waste shall be responsible for:
- (a) Safe maintenance of equipment; and
 - (b) Providing appropriate facilities and training in procedures for decontaminating vehicles that have been contaminated following an incident such as a spill.
- 9.3.4 The vehicle shall be maintained in a clean and roadworthy condition.
- 9.3.5 It is essential that for proper waste containment all waste containers be secured and stowed on the vehicle.
- 9.3.6 The approval/permit holder shall provide evidence that the driver of the vehicle has completed a course of instruction on the transport of such waste.
- 9.3.7 Appropriate vehicle and public liability insurance should be obtained in accordance with transport and dangerous goods codes in Australia and New Zealand if the vehicle is used to transport waste in packages. The insurance should include third party property clause with respect to loss or damage as a result of fire, explosion or spillage of waste. Clean-up costs incurred by, or on behalf of, a public authority should also be covered.

9.4 VEHICLE SIGNAGE

- 9.4.1 Vehicles, which transport clinical and related waste that are also considered to be dangerous goods, shall do so in accordance to the relevant Australian or New Zealand code for the transport of dangerous goods by road and rail.
- 9.4.2 Signage of the vehicle is the responsibility of the waste transporter and shall be displayed while the vehicle is transporting waste.
- 9.4.3 For any quantity of cytotoxic and clinical waste, placards shall be displayed on the front and rear of the vehicle. This also applies to Pharmaceutical Waste in Australia.
- (a) The type of placards to be used depends on the legislative requirements of the relevant agency within each jurisdiction. Transporters of the wastes referred to in 9.4.3 (a) shall consult the agency to ascertain what placard(s) are to be displayed and under any specific conditions.

- (b) Examples of placards that are required to be used are illustrated in Figure 1.
- (c) Examples of requirements are as follows:
- Cytotoxic Waste - use UN Hazard Class 6.1/TOXIC and recommended Cytotoxic Waste symbol.
 - Clinical Waste - use UN Hazard Class 6.2/INFECTIOUS SUBSTANCE.
 - Pharmaceutical Waste - use UN Hazard Class 6.1/TOXIC.
 - Clinical and Related Waste - use Infectious Waste placard in Victoria.



Black on White (reflective)



Black on White (reflective)



White on Purple (reflective)

Figure 1: Format for Vehicle Signage

(Source: United Nations Recommendations for Transport of Hazardous Goods)

9.5 WASTE TRANSPORT CERTIFICATES

A certification system should be implemented to adequately identify source and transport path to disposal. Compliance with jurisdictional Transport Certificate systems shall occur. Note that currently, a “Waste Transport Certificate” registration system is not applicable in New Zealand.

9.5.1 The generator is responsible for ensuring that:

- (a) Clinical and related waste are segregated, packaged, labelled, stored, transported, treated and disposed of in accordance with the requirements of the relevant authorities;
- (b) In New Zealand, accurate Transport of Dangerous Goods documentation is provided;

- (c) A transporter using vehicles that have relevant government approvals is chosen;
- (d) The waste is being transported to a licenced facility capable of treating or disposing of the waste in an environmentally acceptable manner; and
- (e) All Sections of the transport certificate pertaining to generator information are accurately completed.

9.5.2 The waste transporter is responsible for:

- (a) The transport certificate if the transporter is registered as an accredited agent by the generator and the relevant authority;
- (b) Ensuring the transport of clinical and related waste is done in accordance with approval/permit/licence conditions and Dangerous Goods requirements as applicable; and
- (c) Completing and using transport certificates when transporting waste, irrespective of vehicle type and carrying capacity.

9.5.3 The waste treatment/disposal/storage facility is responsible for:

- (a) Accepting only those wastes for which they have been approved to store, treat and/or dispose;
- (b) Completing and signing original transport certificate;
- (c) Noting any discrepancies between the waste described on certificates and that being received; and
- (d) Not accepting any waste at the disposal facility, which is not accompanied by a full and accurately completed transport certificate.

9.6 ACCREDITED AGENCY SYSTEM

In some jurisdictions an Accredited Agency System may be in place. An accredited agent is a person/ company authorised in writing by the relevant authority to complete certain Sections of the waste transport certificate on behalf of the waste generator.

9.6.1 Accredited agency/contractor shall have an identification number and a document stipulating the conditions, limitations and requirements with which they shall comply.

9.7 TRANSBOUNDARY TRANSPORTATION OF CLINICAL AND RELATED WASTE

The transportation of Clinical and Related waste across borders in Australia shall now satisfy the requirements of national manifest systems as applicable. Waste generators, transporters and treatment/disposal/storage companies should consult the relevant authorities for details.

In Australia, transportation of clinical and related waste across State/Territory borders shall be undertaken in compliance with the National Environment Protection Measure “Movement of Controlled Waste Between States and Territories”, or jurisdictional legislation implementing the NEPM (where applicable).

9.8 RAIL TRANSPORTATION

Reference shall be made to the most recent edition of the [Code of Practices and Conditions for the Carriage of Dangerous Goods](#) or the [Australian Code for the Transport of Dangerous Goods by Road and Rail \(ADG\)](#) or the [New Zealand Standard NZS 5433:1999 Transport of Dangerous Goods on Land](#) and any amendments or enactments relating to the Transport of dangerous goods on land, in regards to the requirements for shipping poisonous and clinical and related waste/substances, and any requirements of the appropriate regulatory authority.

9.9 AIR TRANSPORTATION

Reference shall be made to the International Air Transportation Association (IATA) [Dangerous Goods Regulations](#) (2002), and any requirements of the appropriate regulatory authority.

9.10 MARINE TRANSPORTATION

Reference shall be made to the International Maritime Organisation (AIM)’s [International Maritime Dangerous Goods Code](#) (2002), and any requirements of the appropriate regulatory authority.



10. Treatment and Disposal Facilities

This Section describes the general requirements for treatment facilities. Different treatment technologies can have differing capacities and may be licenced to treat different waste types. All treatment and disposal facilities must meet the regulatory requirements as specified within each jurisdiction that the facility operates. For further information regulatory agencies and/or the operators of the treatment/disposal facility should be contacted.

It is important to note that operators of treatment and disposal facilities should allow waste generators to inspect the facilities as part of due diligence programs.

10.1 SITING AND DEVELOPMENT OF TREATMENT FACILITIES

10.1.1 All members shall complete an Environmental Impact Statement (EIS) prior to undertaking development of new facilities or major expansion and redevelopment of existing facilities. This will help ensure new sites are selected and developments undertaken with environmental and community concerns taken into account.

Any facility that will be undertaking research and development and because of this applies for an exemption under relevant legislation shall also undertake an EIS. Any application for conversion from a research and development facility to a full commercial facility shall be accompanied by an EIS.

10.1.2 The Environmental Impact Statement shall be issued for community consultation and advice irrespective of whether an EIS is required by relevant regulatory authorities.

10.1.3 Where existing facilities have not been the subject of an EIS; members shall conduct a comprehensive Environmental Review to ascertain the current environmental status of their facilities and operations. This review shall be conducted in accordance with the ISO 14004 or similar (e.g. Enviromark) Environmental Management Standard.

10.1.4 Environmental Performance Criteria shall be developed on the basis of the findings of the EIS or Environmental Review. These shall be recorded and documented within the facility's Environmental

Management System, Quality System or operational plans. At intervals following commissioning of the facility or ongoing operations, environmental reviews shall be undertaken and the results of audits and routine monitoring compared with the predetermined performance criteria to assess whether corrective actions are necessary to maintain continued improvement in environmental performance.

- 10.1.5 A State of Environment Report shall be provided to stakeholders annually after commencement of operations. This report should identify both positive and negative aspects of the facility's environmental performance.

10.2 CLINICAL AND RELATED WASTE TREATMENT AND DISPOSAL METHODS

The two most important criteria for the selection of a suitable option for the treatment and disposal of clinical and related waste are:

- (a) To ensure that the method of treatment and by-product disposal will meet acceptable biological standards; and
- (b) To ensure that there is minimal adverse environmental impact with respect to water, soil, air and noise.

All clinical and related waste treatment technologies shall therefore be subject to regular monitoring within the system and periodic testing of their by-products by an independent, accredited organisation to ensure that these criteria are being achieved.

10.2.1 Any treatment option for clinical and related waste shall:

- (a) Render the waste non-infectious;
- (b) Render the waste unrecognisable;
- (c) Achieve a significant volume reduction;
- (d) Result in residues being suitable for approved reuse or disposal;
- (e) Result in minimum levels of hazardous or toxic by-products as approved by the relevant authority;
- (f) Be verifiable for the treated wastes;
- (g) Have automatic controls and built-in failsafe mechanisms;
- (h) Have continuous automatic monitoring and recording;
- (i) Ensure that the waste cannot bypass the treatment process;
- (j) Meet relevant occupational health and safety standards;

- (k) Have failsafe alternative treatment and disposal in case of emergency; and
- (l) Where feasible, implement materials and energy recovery strategies.

10.2.2 Clinical and related waste transporters and treatment/disposal companies are required to supply notification IN WRITING to existing or potential clinical and related waste generators of any segregation requirements for wastes that can be accepted for storage, transport, treatment or disposal; and for the exclusion of wastes which are not licenced to be stored, treated or disposed of at the intended disposal facility.

10.3 WASTE TREATMENT AND DISPOSAL METHODS

In nearly all jurisdictions, standards and environmental outcomes for treating clinical and related waste are prescribed rather than specific requirements for each of the different treatment technologies. Any technique for the treatment of clinical and related waste shall be processed through the relevant approvals process applicable in the jurisdiction where approval is sought. This allows the regulatory authority to respond to the constantly evolving demands for the best environmental outcomes for industry's needs to access the most cost-effective solutions.

For each technology process description and equipment, see Appendix One. Appendix Two provides a summary of the waste types that are generally allowed/prohibited from each treatment technology.

Facility operators shall state clearly to their clients the types of wastes their process is able to treat. Where a facility is unable to effectively treat specific wastes, then the facility operator shall advise the client as to how these wastes are to be managed by the facility operator.

10.4 EQUIPMENT AND FACILITY DESIGN AND CONSTRUCTION

The design and construction of facility and equipment shall be such as to ensure effective treatment of clinical and related waste. All equipment shall be purpose designed and constructed in accordance with all applicable Standards and regulatory authority requirements.

10.5 EMISSION STANDARDS

This Code does not set emission or effluent discharge standards for the Industry. A minimum goal shall be compliance with requirements of regulatory authorities. However, this Code requires the Industry to strive towards Best Practice through a commitment to continual improvement in environmental performance.

Progress towards achieving continual improvement shall be demonstrated by:

- (a) Monitoring work place fugitive and stack/exhaust duct emission levels, and discharges to soil and water;
- (b) Drawing up a plan of action to reduce emission levels;
- (c) Issuing a State of the Environment report that discloses all emissions; and
- (d) Charting progress achieved since last report.

The Australian/New Zealand Standard AS/NZS ISO 14004 Environmental Management System Guideline or equivalent document can serve as a basis for achieving continuous improvement in environmental performance.

Note: This does not in any way imply a requirement for ISO 14001 certification.

10.6 OPERATIONS MANAGEMENT

- 10.6.1 At treatment/disposal facilities loading of waste into treatment/disposal devices shall be performed mechanically to maintain the integrity of waste and minimise the risk to workers.
- 10.6.2 All equipment shall be loaded and operated according to manufacturers' specifications.
- 10.6.3 The treatment plant shall be maintained in such condition that design specifications are met and controls, instruments and interlocks are working when the process plant is in use.
- 10.6.4 The treatment plant shall be placed under the control and supervision of a suitably qualified and/or experienced person, thoroughly instructed by the manufacturer or equivalent in the operation of the process plant and approved by the relevant authority in each jurisdiction.
- 10.6.5 Company staff shall be given thorough training and instruction in the operational procedures of the treatment plant. This training should be competency based. When operating, an appropriately trained person shall supervise the plant.

- 10.6.6 A summary of operating instructions and conditions shall be prominently displayed in the control room. Contingency and emergency procedures shall also be prominently displayed.
- 10.6.7 A spill kit shall be provided to manage spills of all waste types accepted at the facility. The size and capability of the spill kit shall be directly related to the types and quantities of waste that may be on-site.

10.7 WASHDOWN EFFLUENTS

- 10.7.1 Disinfection of bins shall be achieved. Bin washing should be a three-stage process, which includes:
- (a) A cold wash;
 - (b) Hot detergent - disinfectant wash; and
 - (c) A hot wash; or
 - (d) Any alternative process which suitably sanitises/disinfects the bins.
- 10.7.2 The bin washing process shall minimise personnel exposure to aerosols.
- 10.7.3 Where odour is a problem a deodoriser may be required.
- 10.7.4 A program of random spot checks/swabs should be implemented to assess cleaning efficacy.
- 10.7.5 The bin washing process shall be located in a bunded area or an area bounded by cut-off drains.
- 10.7.6 Wash down liquids from the cleaning of waste bins and storage areas shall not be allowed to enter the stormwater system.
- 10.7.7 Checks of all bins shall be conducted to ascertain if any are damaged and require replacing or repairing.

10.8 OPERATIONAL RECORDS

- 10.8.1 It is recommended that an environmental management system based on the AS/NZS ISO 14000 or similar (e.g. Enviromark) series of environment management standards be established to ensure auditable, verifiable documentation is available to demonstrate that operations are occurring as claimed. Such a system will also assist with provision of quality data and information on which a State of Environment report can be prepared.

The keeping of records shall comply with the regulatory control requirements enforced by the responsible jurisdictions.

- 10.8.2 Records shall be kept of all waste accepted at the premises and/or transferred to other premises and shall include the following:
- (a) Date of acceptance;
 - (b) Identifying label and number or similar to identify the origin of the waste load;
 - (c) Weight of waste;
 - (d) Type of waste;
 - (e) Type of treatment;
 - (f) Time of treatment;
 - (g) Date of treatment;
 - (h) Date and the facility wastes forwarded to;
 - (i) Date of disposal of treatment residues to landfill; and
 - (j) Address of disposal landfill site.

10.9 PROCESS MONITORING AND RECORDING

- 10.9.1 In order to verify that original process conditions are maintained, and in the absence of any regulatory control, monitoring for these parameters shall occur every month for the first 6 months, every second month for the next 6 months and thereafter at 6-month intervals. Parameters to be monitored are process dependent. Copies of appropriate recording charts or equivalent recorded data shall be retained for a minimum of 12 months or as required by relevant statutory authorities.
- 10.9.2 All treatment processes shall be equipped for continuous automatic monitoring and recording of key operational and output parameters.

10.10 PROCESS INSTRUMENTATION AND CONTROL

- 10.10.1 All process instruments shall be calibrated regularly to ensure accurate readings.
- 10.10.2 All relevant process management instruments e.g. thermometers and timers, shall produce an audible and visual alarm. Such alarms shall be recorded automatically and manually if lesser or greater values are indicated than required for effective treatment of the waste.

10.11 SAMPLING

- 10.11.1 All process equipment, gas discharge stacks, exhaust ducts and liquid discharge pipes shall be fitted with appropriate ports and sampling facilities to enable valid samples to be obtained for subsequent chemical and/or microbiological analysis as required by the relevant regulatory authority.
- 10.11.2 A document shall be prepared outlining the timing, frequency and nature of sampling to be undertaken to validate effectiveness of treatment processes and monitor residues, discharges and emissions. This document should form part of an Environmental Management System.

Staff undertaking sampling and monitoring shall be trained and qualified to undertake the tasks.

10.12 OTHER CONDITIONS

- 10.12.1 All instrumentation is to be maintained in accordance with the manufacturer's specifications
- 10.12.2 All records, log books and continuous monitoring data are to be kept on site for at least twelve months (or longer as required by regulatory authorities), and made available upon request to authorised officers under the relevant legislation.
- 10.12.3 All residues shall be stored and transported for disposal to an approved landfill site in enclosed/covered containers.
- 10.12.4 The following shall be kept on site:
- (a) Specifications for the process treatment plant and pollution control equipment including all associated auxiliary equipment and instrumentation;
 - (b) Procedures and operational manuals;
 - (c) Maintenance manual;
 - (d) Training manual; and
 - (e) Emergency procedures manual.

Procedures in manuals shall be followed and any departures from procedures are to be confirmed in writing to the relevant licensing authority.

- 10.12.5 Any change or modification to the approved operating plant and equipment is to be approved by the appropriate regulatory authorities.

10.13 MICROBIAL TESTING

10.13.1 Processes for treating clinical and related waste shall ensure an acceptable level of microbial inactivation. Commissioning of plant shall include a demonstration of the efficacy of the treatment process by inclusion of appropriate test organisms in a typical waste feed. This efficacy testing shall be repeated at predetermined intervals and the results included in the facility's or organisation's Environment Performance Report.

10.13.2 Regular tests shall be conducted for all clinical and related waste treatment technologies to ensure microbial inactivation is achieved to meet the minimum requirements of:

- (a) Safety; and
- (b) Environmental protection.

A suitable test procedure shall be developed, implemented and maintained to ensure acceptable microbial inactivation is achieved.

Reference should be made to the relevant State/Territory regulatory authority as to what is considered an acceptable level of microbial inactivation.

10.14 WASTE CONTROL DOCUMENTATION

This Section outlines the responsibilities of treatment/disposal facility operators in ensuring that documentation is correctly completed for both regulatory requirements and to assist waste generators in meeting due diligence requirements.

All waste pick-ups shall be individually identifiable and traceable back to the generator.

10.14.1 These waste control documentation requirements apply to:

- (a) Treatment/disposal facilities where the waste is treated and/or destroyed;
- (b) Intermediate handling facilities where the waste is treated prior to disposal;
- (c) Treatment/disposal facilities where waste that does not meet the treated and destroyed criteria (outlined in Section 10.2) is disposed.

10.14.2 The generators shall maintain shipment logs for both the original generation point and central collection point.

10.14.3 Waste Tracking requirements include:

- (a) Treatment/disposal facilities shall return signed copies of the tracking form to the generators acknowledging receipt of the waste;
- (b) Intermediate handlers shall sign the tracking form to acknowledge receipt of the waste; after the waste is treated, they shall initiate a new tracking form if shipment of waste to a disposal facility is required;
- (c) Copies of tracking forms shall be kept for incoming waste and for shipments of waste from intermediate handlers;
- (d) Intermediate handlers shall maintain logbooks or record systems to match incoming and outgoing shipments; and
- (e) Copies of discrepancy reports shall be retained and noted for future audits.

11. Disposal of Treatment Residues

This Section outlines the requirements for disposal of solid, liquid and air wastes/emissions from clinical and related waste treatment technologies commissioned for use. Management, which includes disposal of any residues and air emissions, shall meet all relevant authorities licensing and other requirements.

The ANZCWMIG does not support the use of landfill disposal for untreated clinical and related waste. The use of landfill for disposing of clinical and related waste should be progressively phased out owing to the unknown risks to the environment, waste handlers and the wider community.

The receiving environments for the disposal of residues are:

- Air - gases and particulates;
- Water - effluents and liquid residues; and
- Land - solid residues.

Before any residues from treatment technologies are released or disposed into air, water or land environments they shall satisfy all biological, chemical and physical standards set down by the relevant authorities.

Tests for both leachate and microbial inactivation shall be conducted by a relevant testing and accreditation authority approved laboratory on the solid residues intended to be disposed at a landfill site, which is approved, by the relevant authority. However, the microbial testing protocols to be used need to be congruent with the relevant treatment technology.

11.1 RESIDUE DISPOSAL

Consideration before disposal shall be given to:

- (a) All available options for reuse or energy/resource recovery of residues;
- (b) Whether the solid residue is toxic;
- (c) Whether any of the residues are recognisable; and
- (d) Potential chemical reactivity within the receiving environment (including landfill);

- 11.1.1 Process by-products can be disposed of in a landfill provided the landfill has been designed, engineered and licenced to accept, without environmental harm, such residues. The wastes need to meet the criteria as set out in the landfill operation licence or specified by the relevant regulatory authority.
- 11.1.2 In the event that residues are classified as hazardous, then they shall be disposed of in an appropriately licenced disposal facility, or at a facility approved by the relevant authority.
- 11.1.3 In the collection and disposal of process by-product residues, the following shall apply:
- (a) Care shall be exercised in the removal and disposal of residue(s);
 - (b) The removal of process by-product residue shall be mechanised and designed to facilitate continuous or semi-continuous operation so that the disposal process operation can run efficiently;
 - (c) Dry residues should be wetted prior to handling to minimise risk of fire and the generation of airborne dust;
 - (d) The amount of water used in wetting shall be controlled to minimise the potential for leachate generation in the landfill;
 - (e) The process residue shall be stored in enclosed containers which are then appropriately secured and transported to an approved site; and
 - (f) Some treatment process residues may contain chemicals, which could interact with other materials in a landfill. Consideration shall be given to the stability and nature of such process residues and any potential impacts prior to disposal to landfill.

11.2 STORMWATER MANAGEMENT

Stormwater shall be controlled to prevent contact with spillages, wash down effluents or other materials in operational areas. Such control shall be adequate to prevent the migration of contaminants off-site. Management options include:

- (a) Diversion valves;
- (b) Covered areas and bunds to prevent stormwater contact with operational areas; and
- (c) Collection areas and/or settling tanks for holding water.

12. Occupational Health and Safety

This Section considers the types of occupational risks, relevant OH&S management issues and how they should be managed, and the achievement of compliance with statutory requirements. This Section also provides guidance as to the content and objectives of emergency/contingency plans

12.1 OCCUPATIONAL RISK AND MANAGEMENT

There are two major types of occupational health and safety concerns associated with clinical and related waste management, the risk of disease and the risk of injury.

12.1.1 To minimise the risks associated with clinical and related waste, safeguards shall be employed against exposure to (or contact with) any agents, which can cause disease or injury. These include:

- (a) Infectious agents;
- (b) Bioaerosols
- (c) Toxic and hazardous chemicals;
- (d) Pharmaceuticals
- (e) Sharps; and
- (f) Cytotoxics.

Further details on the specific hazards associate with each of these agents can be obtained from State/Territory Environmental, Health and/or Occupational Health and Safety government agencies.

12.1.2 To reduce the risk of contracting a disease from waste handling it is necessary to:

- (a) Assume that the nature of the potential causative agent present in the waste is of a high risk level ie. standard precautions to be adopted requiring maximum care to be taken (e.g., personal hygiene practices, use of personal protective equipment, appropriate handling and disposal and environmental controls), and all precautions adopted (refer to glossary for explanation of standard precautions);

- (b) Actively promote the correct segregation and labelling of all wastes at source;
 - (c) Identify the type and degree of possible exposure;
 - (d) Establish the health status of the 'at risk' personnel by ascertaining their immunisation status and determining if there are any medical issues that need to be considered; and
 - (e) Minimise handling of the waste at all points (e.g. reduce double handling).
- 12.1.3 In consultation with employees, risk assessments should be conducted into the management of all clinical and related waste handled by the organisation.
- 12.1.4 In order to manage the risks identified, the following steps are essential:
- (a) Categorise the degree of risk;
 - (b) Develop strategies for control of risks (e.g. segregate and label all waste at source and no manual handling of wastes);
 - (c) Implement the controls;
 - (d) Evaluate the controls (e.g. regular risk assessments conducted); and
 - (e) Continue employee consultation.
- 12.1.5 The risk of chronic or acute exposure to clinical and related waste can be minimised through the use of correct waste management procedures for the handling, movement and storage of wastes and through emergency preparedness, education and awareness of staff.
- 12.1.6 The risk of exposure to radioactivity can be avoided by proper management procedures adopted by waste generators. Each waste storage, treatment and disposal facility in Australia shall have the means of detecting radioactive wastes brought on-site. In New Zealand, the National Radiation Laboratory (NRL) sets the criteria for the release of this waste for disposal.
- 12.1.7 Ensuring that there is proper ventilation controls in all areas where clinical and related waste are handled and stored to minimise airborne dispersion of dusts and micro-organisms.
- 12.1.8 To avoid accidents and to prevent injury to personnel, including waste generators, transporters and disposal facility personnel, it is essential that the following general practices be implemented along with the specific practices as detailed throughout this Code of Practice:

- (a) Develop clear communication channels between all involved parties, to ensure safe and consistent practices are maintained;
- (b) Train all personnel in safe work practices, including hygiene practices (correct hygiene practices are critical in protecting workers against occupational health risks);
- (c) Provide appropriate amenities for hand washing/showers and lunchrooms;
- (d) Train personnel in the correct use of personal protective equipment, such as:
 - i. safety boots;
 - ii. safety helmet;
 - iii. safety glasses/face shields;
 - iv. respiratory protective equipment;
 - v. safety gloves; and
 - vi. safety aprons.
- (e) Ensure that all safety equipment is always available and in good working order and that routine checks of all equipment are carried out;
- (f) Ensure adequate access and space for movement in secure storage areas and that bins are stored properly eg not stacked too high;
- (g) Use appropriate bins or similar collection containers as specified in Section 7.2;
- (h) Eliminate any handling involving direct physical contact of the contents of clinical and related waste containers, in particular sharps waste;
- (i) Ensure that transport of waste is conducted in a safe manner and this includes the loading/unloading of any waste container from vehicles or storage areas;
- (j) Eliminate the manual compression of all clinical and related waste; and
- (k) Train all personnel in spill containment procedures, and ensure spill containment materials and equipment are always available and in good working order.

12.1.9 To reduce the risk to personnel it is essential that staff realise that individual's actions during waste transport, treatment and disposal

affects those who subsequently handle or work with this waste. People who may be affected include:

- (a) Waste generator staff;
- (b) Maintenance workers;
- (c) Operators of treatment equipment;
- (d) Waste handlers and transport drivers;
- (e) Landfill workers;
- (f) Emergency services personnel; and
- (g) Public.

12.2 MANAGEMENT RESPONSIBILITY

Management has primary responsibilities under the various jurisdictions workplace health and safety (and other), legislation for employee health and safety. The following provides an overview of those responsibilities.

Areas of acknowledged managerial responsibility include:

- (a) Effective and appropriate human resource management;
- (b) Consultation with employees on health and safety issues;
- (c) Establishment of standard operating policies and procedures with regular performance monitoring;
- (d) Development of emergency/contingency plans; and
- (e) Provision of appropriate and adequate staff training.

Management also has responsibility to ensure that the workplace is designed (e.g., by the use of smooth impervious surfaces), and maintained to support positive infection control and cleaning (to prevent microbial contamination).

12.2.1 For issues pertaining to staff training refer to Section 13.2.

12.2.2 For management issues pertaining to emergency/contingency plans refer to Section 12.3.

12.2.3 Relevant immunisations (e.g. hepatitis, tetanus) shall be made available to all personnel who handle, transport, treat and/or dispose of clinical and related waste. An immunisation record should be maintained for each staff member.

Note: It is management's responsibility to seek on-going advice from qualified medical personnel on appropriate vaccinations and protocols for testing the efficacy of those vaccinations.

All personnel shall:

- (a) Be given a pre-placement and periodic medical examination following a protocol designed by a suitable qualified medical practitioner such as an occupational physician, at the expense of the employer;
- (b) Be provided with access to appropriate immunisations against Hepatitis A and B, tetanus and any other precautions deemed necessary by an occupational physician at the expense of the employer. Note: it is important that documentation of the offer of immunisation be recorded in the event of the staff member refusing such immunisations. However, the risk to any staff member, who refuses immunisations should be managed in other ways as the refusal does not negate the employer's statutory obligations/duty of care;
- (c) On induction, employees shall be given a comprehensive training program and be required to attend a regularly scheduled training program providing updated information relevant to their occupation.

12.2.4 A blood and body fluid exposure and/or sharps injury policy shall be in place encompassing initial first aid treatment, medical follow up and confidential counselling.

12.2.5 A copy of the waste management plan, and any other policies and procedures relevant to waste management shall be made available to all employees.

12.3 EMERGENCY/CONTINGENCY PLANS

12.3.1 Contingency plans shall be established for all emergencies, which are likely to occur as a result of the handling, storage, transport, treatment and disposal of clinical and related waste.

12.3.2 The preparation and implementation of contingency plans shall be the responsibility of the principal operator of the particular service in consultation with other contracted operators and relevant authorities (e.g. EPA, fire service, police etc.).

12.3.3 The plan shall address any incidents for which the facility is at most risk and shall serve as a reference for risk assessment and employee training. Risk management requires:

- (a) A risk assessment of the hazards and potential hazards;

- (b) Control of hazards;
- (c) Induction and continual training;
- (d) The use of approved collection and disposal bins;
- (e) Approved technologies and methods to be used during the handling, storage, transport, treatment and disposal of waste;
- (f) Development of a risk management plan; and
- (g) An audit system to ensure compliance with procedures and to assist in review and revision of risk management systems.

12.3.4 The objective of planning for emergencies is to identify actions that need to take place in an emergency and prepare for them ahead of time leaving as many resources as possible available for emergency response. The following are the steps that shall be taken in planning for the management of potential accidents:

- (a) Establish and maintain occupational health and safety procedures for all aspects of operations;
- (b) Identify potential risks;
- (c) Outline emergency scenarios;
- (d) Establish command hierarchy;
- (e) Organise lines of communication;
- (f) Determine response actions;
- (g) Delegate responsibilities; and
- (h) Designate an evacuation signal, identify rendezvous points and mark these on an appropriate map/plan for each area. Area plans shall be displayed in their respective areas.

12.3.5 The plan shall also co-ordinate with the local fire service, police and ambulance emergency response plans.

12.3.6 Personnel requirements for emergency/contingency planning include:

- (a) Treatment/disposal operators and drivers who are familiar with:
 - i. Procedures for both small and large spillages;
 - ii. Types and use of emergency equipment; and
 - iii. Types and use of personal protective equipment.
- (b) An emergency response team who are familiar with:

- i. Statutory requirements;
- ii. Hazards of the waste;
- iii. Labelling requirements;
- iv. Transport documents;
- v. Construction and layout of containers and vehicles;
- vi. Use of emergency equipment, protective clothing and equipment;
- vii. Safe handling and containment procedures;
- viii. Spill management requirements outlined in the Communicable Diseases Network of Australia “Infection Control Guidelines for Prevention of Transmission of Infectious Diseases in the Health Care Setting”, Commonwealth of Australia 2004; and
- ix. List of contacts ie. police, fire service, hazardous chemical response unit, local authorities and transporter; and environmental and public concerns.

12.4 COMPLIANCE

It is important that all aspects of clinical and related waste management (ie. handling, storage, transportation etc) comply with applicable legislation as well as relevant Standards, this Code and other codes of practice mentioned in this document.

While compliance with regulations should provide for relatively safe operation of a facility, such minimum activity yields minimum benefits. It will be more beneficial over time to operate at maximum safety levels.

12.4.1 Operation at maximum safety levels requires the establishment of an accident and risk reduction program, which includes:

- (a) Prompt recording and reporting of all incidents;
- (b) Investigation of cause;
- (c) Identification of reasons for incident;
- (d) Implementation of corrective actions including operator awareness and training where relevant; and
- (e) Revision of standard operating procedures.



13. Education and Training

This Section provides guidance on the principles and requirements of an employee-training program, training methods, assessment procedures, training schedule and record keeping. This Section refers to all employees who are involved in the generation, transport, treatment and/or disposal of clinical and related waste from the point of generation to final disposal.

13.1 EMPLOYEES

13.1.1 'Employees' in this Section refers to the following:

- (a) Those who generate the waste;
- (b) Those who handle and/or transport the waste on and off-site;
- (c) Those who operate or maintain the treatment equipment;
- (d) Those who handle waste at the disposal facility;
- (e) Reception and Administrative staff; and
- (f) Managers and Executive level positions.

13.2 EMPLOYEE TRAINING

13.2.1 Establishment of standard operational procedures is not sufficient. The employees shall be trained so that they can:

- (a) Implement procedures quickly and easily;
- (b) Understand the importance of good hygiene practices;
- (c) Understand their role and how they contribute to the overall management of clinical and related waste; and
- (d) Understand the importance of following standard operating practices.

13.2.2 All employee and contractor staff shall be trained on induction. In facilities where there is a large number of temporary, casual or relieving staff it is important that a training strategy be developed with these people in mind (e.g. ensuring that they are identified by Human Resources for training).

13.3 THE TRAINING PROGRAM

- 13.3.1 Training programs shall be competency based. This ensures that staff achieve the necessary knowledge and skills to conduct all tasks safely and effectively.
- 13.3.1 The amount of detail and extent of training required will depend on the nature of the hazard associated with the type(s) of clinical and related waste, the role and responsibilities of the employees receiving training, and the complexity of the work procedures and control measures required to minimise the risk of exposure.
- 13.3.2 Drivers of transport vehicles shall, in addition, attend a hazardous goods transport-training course.
- 13.3.3 The training program should also reflect any new changes in legislation or contractual requirements and ensure all appropriate personnel receive required education/training.
- 13.3.4 Indicative topics that should be included in a training programs are:
- (a) Relevant job duties which includes emergency procedures and use of personal protective equipment;
 - (b) Definitions;
 - (c) Hazards associated with clinical and related waste;
 - (d) Information on occupational risks to satisfy the employee's right to know such as safe sharps handling and the management of sharps injuries;
 - (e) Personal hygiene practices (e.g., hand washing);
 - (f) Procedures to ensure that job functions are conducted in a safe manner and in accord with organisational requirements methods (e.g., not to manually compress waste and to not place hands into waste containers);
 - (g) The purpose and implementation of occupational health and safety;
 - (h) Legislative requirements relating to waste operations;
 - (i) Segregation, containerisation and transport;
 - (j) Treatment and disposal options;
 - (k) Management of spills; and
 - (l) Management of emergencies.

13.4 TRAINING METHODS

- 13.4.1 Different training methods should be used as appropriate. In most cases formal training sessions will be appropriate. However, training programs should be developed so that they include a mix of formal presentations and problem solving activities. Those providing training should investigate the availability and appropriateness of audiovisual and other teaching aids to enhance the training sessions.
- 13.4.2 Where possible, hands-on training should be included in the training program when relevant. One-on-one or small groups with careful supervision is best for hands-on training, enabling trainees to practice the techniques until they feel comfortable performing them. The hands-on training section of the course should consist of:
- (a) Demonstration as well as practice of correct techniques;
 - (b) Communication of the rationale for the established procedures (e.g., environmental, human health, economic);
 - (c) Explanation of the reasons for doing something in a particular way; and
 - (d) Question and answer sessions.
- 13.4.3 Follow up training should be included in the training program as it increases the training effectiveness and provides data about retention of information, long term effectiveness and the need for refresher courses. Follow up training should include:
- (a) Random testing of operational and emergency procedures;
 - (b) Written tests; and
 - (c) Drills of particular activities such as emergency response techniques.

13.5 ASSESSMENT

- 13.5.1 Testing of employees on material taught is essential to assess the effectiveness of training programs, however testing should not be extensive (ie. short quizzes or multiple choice would be sufficient). Testing should involve competency-based assessment (that is practical activities). Testing should:
- (a) Identify employees who need additional training;
 - (b) Identify problem areas that need emphasis or a different type of presentation in subsequent courses; and

(c) Evaluate the effectiveness of the training program.

13.5.2 Test results should be used to evaluate the overall effectiveness of the training program as well as individual parts of the program.

13.6 TRAINING SCHEDULE

13.6.1 Repeat sessions and refresher courses are essential to promote and restore interest, awareness and concern.

13.6.2 A schedule is needed for the initial presentation of the course as well as for subsequent refresher courses. The schedule should be flexible with additional courses provided as the need arises.

13.7 INSTRUCTORS AND INSTRUCTIONS

Instructors shall be suitably trained in the relevant areas and capable of conveying instructions, which are easily understood by the trainees. Instructors shall be provided with adequate time and resources to prepare appropriate training aids.

13.8 RECORD KEEPING

13.8.1 The following information shall be included in the records for the training program:

- (a) A record of the courses given in the training program with schedules for initial and repeat presentations of each course;
- (b) A detailed record for each course, including the contents of the course, the location and time of each course, a roster of the attendees with names and job title, the name and qualifications of the instructor, the schedule for hands-on training and the tests administered;
- (c) A file for course evaluations and a record of all responses made to these evaluations; and
- (d) A record in each employee's personnel file that includes courses attended, training received and test results.

13.9 WASTE TREATMENT OPERATOR TRAINING

All operators at a treatment facility shall receive specific comprehensive training appropriate to the safe performance of their duties.

The training shall include:

- (a) Operational features and functions of the waste treatment technology and control equipment;
- (b) Knowledge of the waste and raw materials used at the facility;
- (c) Handling guidelines for clinical and related waste and other commonly encountered wastes that may be received from time to time;
- (d) Knowledge of applicable environmental, workplace and occupational health and safety regulations;
- (e) Practical knowledge of the function and effective use of safety and emergency response equipment; and
- (f) Knowledge of the emergency contingency plan for the facility, including emergency response measures for spills and fires and reporting procedures for emergencies.

APPENDIX ONE:

Clinical and Related Waste Treatment Processes in Use in Australia and New Zealand

The following outlines the specific operational parameters for each of the treatment technologies currently in use in Australia and New Zealand. The information in this Section has been provided by those organisations that operate those technologies and is not intended to prescribe specific operating conditions.

Waste generators are advised to ensure that the treatment facility is licenced for the particular waste(s) to be treated. Generators should obtain specific environmental protection operating licences on request from each individual facility or from the relevant regulatory authority in each jurisdiction.

AUTOCLAVE

There are several types of autoclave process that are operating in the different jurisdictions. Advice should be sought from the operators of each type to ascertain specific process descriptions and any variations to what wastes are able, or excluded from the treatment process. In addition, some autoclave processes are combined with shredding/granulation.

Process description

Autoclaving is the process of steam sterilisation. Steam sterilisation effectively kills microbial flora and fauna through the moisture and heat of the saturated steam. The steam sterilising process is controlled by time and temperature with the parameters set to ensure steam penetration into the most difficult part of the load.

Not all clinical and related wastes can be treated by autoclave system.

Wastes able to be processed/treated

Clinical and related waste that can be treated by the autoclave system:

- Sharps
- Dressing and disposable linen
- Microbiological and pathological waste
- Human and animal tissue
- Body fluids

Specific operating conditions in relation to waste segregation

The following waste cannot be treated by the autoclave system and must be segregated and disposed of in a facility authorised to treat this waste:

- Radioactive material
- Cytotoxic drugs
- Chemicals
- Recognisable body parts
- Pharmaceuticals

ELECTRO THERMAL DEACTIVATION (ETD)

Process description

The ETD treatment process uses low-frequency radio waves and an imposed high energy field to inactivate the medical waste and destroy pathogens, such as viruses, vegetative bacteria, fungi and yeast and spores, without combusting any of the materials.

The electric field created by ETD causes high molecular agitation and thus rapidly creates high temperatures within the microbial cell. This causes the microbial cell to rupture and die. All of the molecules exposed to the field are agitated simultaneously and, accordingly, heat is produced evenly throughout the waste instead of being imposed from the surface as in conventional heating.

Wastes able to be processed/treated

- Sharps
- Dressings and disposable linen
- Microbiological and pathological waste
- Body fluids
- Human and animal tissue

Specific operating conditions in relation to waste segregation

ETD cannot process:

- Cytotoxic drugs
- Body parts
- Pharmaceuticals
- Chemicals
- Radioactive materials

These waste streams must be segregated and sent to a facility authorised to treat such material.

GRINDING/SHREDDING & SODIUM HYPOCHLORITE

Process description

Waste is drawn through the machine via air pressure (no aerosols released to environment). Shredding is carried out in three stages using hammermills. Ground product is passed through an air separator that separates solid waste from the air. The air to be discharged from the system passes through a bank of pre filters, HEPA filters and carbon filters. The ground product is then mixed in a vat with a mist of 2000ppm (part per million) of sodium hypochlorite. The ground product is then transferred to a compactor that reduces the product by volume at the ratio of 14:1. The compacted ground waste is then sent to landfill as inert waste. Fluid extracted from the ground waste flows to a holding pit. Then in compliance with the Trade Waste Water Agreement, the fluid is sent to sewer.

Wastes able to be processed/treated

- Clinical waste
- Sharps

Specific operating conditions in relation to waste segregation

The following waste cannot be processed and must be segregated and sent to a facility licensed to process such waste:

- Pharmaceutical
- Cytotoxic
- Anatomical (human body parts)
- Animal waste

INCINERATION

Process description

Incineration involves the combustion of waste materials at high temperatures to produce an inert ash, carbon dioxide, water and minimal pollutants. A modern clinical waste incinerator equipped with Air Pollution Control Equipment (APCE) destroys infectious and other medical waste components, reduces the volume of the waste material by 90% and controls emissions to the atmosphere.

Incineration is a rapid oxidation process as opposed to landfilling, which involves slow oxidation. One of the major advantages is that all stages of the process are monitored and quantified unlike treatment/landfilling options.

Incineration is a mass conversion process - solid/liquid wastes are reduced to gaseous emission and heat energy. Through the application of heat energy waste solids/liquids are converted back to carbon dioxide and water. Clean and measurable gases with trace pollutants removed to below threshold levels through effective air pollution control equipment.

Clinical waste incinerators consist of a primary chamber and secondary chamber, which may also be referred to as an afterburner. A well-designed incinerator system utilises controlled feed rates, regulated combustion air, high temperatures, good mixing of gases under control for combustion, and sufficient burn time (retention time) to destroy the waste. During incineration process 90% of clinical waste volumes are volatilised off as products of combustion with residual 10% to landfill as ash (non-combustible fraction). Ash or non-combustible fraction consists of inert glass and metal.

Wastes able to be processed/treated

Licence conditions need to be checked in all jurisdictions, but generally all types of clinical and related wastes can be incinerated.

Specific operating conditions in relation to waste segregation

Licence conditions will outline those materials not permitted to be incinerated.

MATRIX PROCESS (ALKALINE OXIDATION)

Process description

The Matrix treatment process relies, as its chief means of disinfection, on subjecting shredded bio medical waste to a high pH environment, generated by the addition of a metered quantity of Calcium Oxide (Quicklime fines) and water. The process of lime hydration and mixing with the shredded waste stream within a controlled residence time, elevates pH and temperature thereby disinfecting the waste prior to compaction and transport to landfill.

There are three basic process steps;

- Shredding waste to a size range of 20 to 30 mm to render waste inconspicuous and to increase the surface area for chemical reaction.
- Disinfecting waste by the addition of Calcium Oxide and water under controlled conditions thus elevating pH and via heat of reaction, increasing the temperature at times above 70° C.
- Dewatering the admixture, compacting the waste residue and transporting to landfill.

The mechanical process is continuous, using shredders, screw conveyors, flow through mixing unit and dewatering screw, and compaction.

Wastes able to be processed/treated

- Sharps
- Dressing and disposable linen
- Microbiological and pathological waste
- Body fluids
- Human and Animal tissue
- Part used cytotoxic (as defined in Appendix 2)

Specific operating conditions in relation to waste segregation

The following waste cannot be processed through a matrix plant and must be segregated and sent to a facility licenced to process such waste

- Cytotoxic drugs
- Chemicals
- Recognizable body parts
- Pharmaceuticals
- Chemical

MICROWAVE DISINFECTION UNIT

Process description

The microwave disinfection unit is a disinfection process that originated in Europe, and is now in use in the Americas and Australia. Prior to receipt at the facility, wastes are segregated, with the microwave best suited to wastes not including anatomical, scheduled pharmaceutical, chemical or cytotoxic wastes. The microwave unit is designed to accept wastes from mobile garbage bins (MGBs), in sizes ranging from 120L to 1100L. Bins are mechanically tipped into an in-feed chamber, where they are held and consolidated before being fed through a shredder.

Shredded wastes are then moved by an auger into a transfer chamber that is used as an intermediate storage area for shredded wastes. From the transfer chamber, wastes are then transferred to the process chamber, which is effectively a long auger. In this area, the wastes are exposed to saturated steam from a boiler at around 150°C. Microwave units produce heat energy. The heat produced coupled with the saturated steam ensure that high process temperatures are maintained, and ensure the avoidance of cold spots in the

process chamber. At all times, the process chamber waste temperature is between 95°C and 105°C. The process will stop if temperatures fall below the minimum process temperature of 95°C.

After wastes have passed through the process chamber, an ejection auger transfers the wastes to a bin or compaction unit for terminal deposition at an appropriate landfill. The system is continually monitored for temperature throughout the process, and treated waste samples are taken for microbial and virological testing. Periodic inspections are also carried out for any microwave leakage.

Wastes able to be processed/treated

- Sharps
- Clinical

Specific operating conditions in relation to waste segregation

- Anatomical
- Scheduled pharmaceutical
- Chemical
- Cytotoxic

ROTATING AUTOCLAVE

Rotating autoclaves utilise steam sterilisation technology in conjunction with a rotating vessel which is designed to break up the waste during the processing cycle to enhance steam penetration within the waste stream. Rotating autoclaves are generally operated in conjunction with a shredding/grinding process.

Process Description

Rotating autoclaves differ from standard autoclaves by virtue of the rotating treatment vessel which includes internal vanes/paddles or a screw design to break up medical waste during the processing cycle. The agitation of the waste serves a dual purpose in terms of ensuring that all materials make contact with the sterilizing steam, as well as decreasing the volume of waste through the combination of moisture, high heat, pressure and agitation.

Steam sterilisation effectively kills microbial flora and fauna through the moisture and heat of the saturated steam. The steam sterilizing process is controlled by time and temperature with the parameters set to ensure steam penetration into the most difficult part of the load. Rotating autoclaves are generally designed to operate at higher temperatures and pressures than stationary autoclaves which combined with the agitation process give them

greater flexibility to treat a wider range of clinical and related wastes than stationary autoclaves.

Wastes able to be processed/treated

- Sharps
- Dressing and disposable linen
- Microbiological and pathological waste
- Human and animal tissue
- Body fluids
- Non hazardous pharmaceuticals waste
- Recognisable body parts

Specific operating conditions in relation to waste segregation

The following waste cannot be treated by the rotating autoclave system and must be segregated and disposed of in a facility authorised to treat this waste:

- Radioactive material
- Cytotoxic drugs
- Chemicals

THERMAL TREATMENT TECHNOLOGY

Process description

Clinical waste is loaded into the system via various sized MGBs. It is automatically fed by a Hydraulic Dumper. The waste is shredded, enters the steam auger where low-pressure steam is injected through multiple ports immediately bringing all waste material to a sterile temperature. The shredded waste enters the steam auger chamber where low pressure steam is injected through multiple ports immediately bringing all material to proper treatment conditions. Following this a low-pressure flash off chamber converts moisture to sterile steam. Treated waste then exits the end of the conveyor into a compactor where its volume is reduced to 10% of its original state.

Wastes allowed to be processed/treated

- Sharps
- Clinical Waste
- Dressing and disposable linen
- Microbiological and pathology waste

- Human and animal tissue
- Body fluids

Specific operating conditions in relation to waste segregation

The following waste cannot be treated by the STI System:

- Radioactive waste
- Cytotoxic waste
- Chemicals
- Pharmaceuticals
- Recognisable body parts

APPENDIX TWO:

Licence Conditions for Clinical and Related Waste Treatment Techniques in Australia and New Zealand

A summary of current conditions of licences for treatment processes in Australia and New Zealand are provided in the following tables. These tables are based on information provided by individual industry members for their particular treatment technologies. Reference to local jurisdictions should be made in order to verify the information relevant to the waste types.

Table 1 - Summary of Current Conditions of Licences for Treatment Processes in Australia and New Zealand – subject to local jurisdiction approvals.

Waste Types	Incineration	Autoclave	Rotating Autoclave	Hypochlorite & Shredding	ETD	Matrix - Alkaline Oxidation	Microwave	Thermal Treatment
Sharps	Y	Y	Y	Y	Y	Y	Y	Y
Clinical	Y	Y	Y	Y	Y	Y	Y	Y
Human Tissue	Y	Y	Y	Y	Y	Y	Y	Y
Recognisable Anatomical Body Parts	Y	N	Y (see 1 below)	N	N	Y	N	N
Cytotoxic	Y	N	N	N	N	Y (see 2 below)	N	N
Pharmaceutical	Y	N	Y	N	N	N	N	N
Chemical	N	N	N	N	N	N	N	N

Note: Y = Yes, N = No (Yes classification does not apply unless licence specifically lists the waste type as acceptable for treatment).

1. For New Zealand Only
2. This process has only been licenced by the Queensland EPA to treat dispensing equipment, (ie. cannulae/needles, all intravenous therapy equipment, containers such as vials and any used dressings-swabs gloves), that have been contaminated with cytotoxic materials.

Table 2 – New Zealand Healthcare waste pre-treatment and disposal methods – subject to local jurisdiction approvals

Waste Category		Waste sub-category	Pre-treatment	Acceptable disposal methods
Non-hazardous	General	Solid	C	I, Lf, SLf
	Recyclable	Liquid		S
		-	C	R, Cm
Hazardous	Sharps		Nil	I
			St and G	Lf, SLf
	Infectious	Body part - Solid ¹	Nil	I, Cr
			M, G	S, I, Cr ¹
			St and G, M	I, SLf, Cr, S
		Body part - Liquid ^{1,2}	Dilute	S
			St	S
		Solid	Nil	I, Cr
			M	I, S, Cr
			St	I, SLf, Cr
	Liquid	Dilute	I, S	
		St	S	
	Cytotoxic		Nil	I, S ³
	Radioactive	In accordance with NRL code		
Other hazardous			I, S ³ , R ⁴ , SLf ⁵	
Controlled			C ⁵ , St, G, M	I, SLf
<p>NOTE -</p> <p>(1) Only minor, minute and non-recognizable body parts may be disposed of to the sewer. Body parts may be released to family/whānau. Refer to body parts policy.</p> <p>(2) Diluted embalming and body fluids may be disposed of to sewer.</p> <p>(3) As approved by local authority.</p> <p>(4) Recycling may only be suitable for a limited range of other hazardous waste.</p> <p>(5) May be compacted only if any liquid expresses if fully contained.</p>				
Pre-treatment:		Acceptable disposal methods:		
C = Compaction		I = Incineration	R = Recycling	
M = Maceration		Lf = Landfill	Cm = Composting	
St = Sterilisation (various methods)		SLf = Sanitary Landfill	Cr = Cremation	
G = Grinding		S = Sewer		

APPENDIX THREE:

Sample Waste Management Plan

The following provides an example of the core elements of a clinical and related waste and Controlled waste in New Zealand management plan. The extent and content of the Plan will be dependant on the type and quantity of clinical waste generated and the services available to manage those wastes on/off-site. The waste management plan should be developed in consultation with all stakeholders and follows the conduct of the waste audit.

The following recommended contents have been adapted from:

- Queensland Environment Protection Agency - [Environmental Protection \(Waste Management\) Regulation 2000](#).
- World Health Organization - [Safe Management of Wastes from Health-Care Facilities](#), 1999.

Contents:

- Scope of the waste management plan.
- Waste avoidance and reduction targets and programs.
- Waste audit protocols and schedules.
- Waste generation/segregation procedures.
- Information on the types, quantities and sources of clinical and related waste and Controlled waste in New Zealand.
- Data collection procedures and requirements.
- Risk management strategies.
- Waste recycling, reusing procedures.



APPENDIX FOUR:

State/Territory Regulatory Agency and other Relevant Websites

The following websites have been provided for those requiring additional clarification and/or guidance for specific State/Territory clinical and related waste management requirements.

Australia

- State/Territory Environmental Agencies:
 - Australian Capital Territory - www.environment.act.gov.au
 - New South Wales - www.environment.nsw.gov.au
 - Northern Territory - www.ipe.nt.gov.au
 - Queensland - www.epa.qld.gov.au
 - South Australia - www.environment.sa.gov.au/epa
 - Tasmania - www.dpiwe.tas.gov.au
 - Victoria - www.epa.vic.gov.au
 - Western Australia - www.dec.wa.gov.au

- State/Territory Waste Management Organisations:
 - Australian Capital Territory - www.nowaste.act.gov.au
 - New South Wales - www.environment.nsw.gov.au
 - Northern Territory - www.ipe.nt.gov.au
 - Queensland - www.epa.qld.gov.au
 - South Australia - www.zerowaste.sa.gov.au
 - Tasmania - www.dpiwe.tas.gov.au
 - Victoria - www.sustainability.vic.gov.au
 - Western Australia - www.dec.wa.gov.au

- State/Territory WorkCover/OH&S Agencies:
 - Australian Capital Territory - www.workcover.act.gov.au
 - New South Wales - www.workcover.nsw.gov.au
 - Northern Territory - www.worksafe.nt.gov.au
 - Queensland - www.whs.qld.gov.au
 - South Australia - www.workcover.com
 - Tasmania - www.wsa.tas.gov.au
 - Victoria - www.workcover.vic.gov.au
 - Western Australia - www.safetyline.wa.gov.au
- Community Sharps and Dialysis Waste Management - www.communitysharps.org.au
- World Health Organization - www.healthcarewaste.org/en/115_overview.html
- Waste Management Association of Australia - www.wmaa.asn.au

New Zealand

- Ministry for the Environment, www.mfe.govt.nz
- Ministry of Health, www.moh.govt.nz, www.medsafe.govt.nz
- Ministry of Agriculture and Fisheries (MAF), www.maf.govt.nz (regards biosecurity and quarantine waste)

APPENDIX FIVE:

Signatory Organisations to the Code as at March 2007

The following organisations are members and signatories to the Code and are Tier 1 members. These organisations have been actively involved in the development and reviews of the Code of Practice.

Ace Waste Pty Ltd

Head Office: 491 Gooderham Road, Willawong QLD 4110 Australia
Dandenong Facility: 64-68 Ordish Road, Dandenong VIC 3175 Australia
Postal Address: PO Box 400, Acacia Ridge QLD 4110 Australia
Tel: +61 7 3372 6666
Fax: +61 7 3372 3777
Contact: John Homewood
Email: jhomewood@acewaste.com.au
Web site: <http://www.acewaste.com.au>

Australian Waste Services Pty Ltd
(Trading as AWS Clinical Waste)
120 Bloomfield Street, Cleveland QLD 4163 Australia
Tel: +61 7 3821 1500
Mobile: 0417 511 500
Fax: +61 7 3821 1525
Contact: Peter Atherton
Email: peter@awsclinical.com
Web site: <http://www.awsclinical.com>

Ancor Flexibles

Winterbourne Road, Stoke Gifford, Bristol, BS34 6PT United Kingdom
Australian Distribution: Specialist Medical Supplies
Unit 2/1 Talavera Road, North Ryde NSW 2113 Australia
Tel: +61 2 9899 2533
Fax: +61 2 9899 1780
Contact: Peter Hudson
Email: specmedical@bigpond.com

BD

4 Research Park Drive, North Ryde NSW 2113 Australia

Tel: +61 2 8875 7000

Fax: +61 2 8875 7100

Contact: Anne Cotterell

Email: Anne_Mayfield@bd.com

BIO-CLEAN

Postal Address: PO Box 1221, Werribee Plaza VIC 3030 Australia

Tel: +61 3 9731 1689

Mobile: 0419 320 624

Fax: +61 3 9731 0601

Contact: Peter Guerin

Email: bioclean@optusnet.com.au

Website: <http://www.bioclean.com.au>

BMDi

Suite 306, Level 3, 63 - 79 Parramatta Road, Silverwater NSW 2128 Australia

Tel: +61 2 9648 4224

Fax: +61 2 02 9648 4225

Contact: John De Smit

Email: John.Desmit@bmdi.net

Deakin University

School of Life and Environmental Science

221 Burwood Highway, Burwood VIC 3125 Australia

Tel: +61 3 9251 7621

Mobile: 0412 036 781

Fax: +61 3 9251 7626

Contact: Trevor Thornton

Email: trevort@deakin.edu.au

Website: <http://deakin.edu.au/>

Ellwaste

6345 Murray Valley Hwy, Cohuna, VIC 3568 Australia

Postal Address: PO Box 480, Cohuna VIC 3568 Australia

Tel: +61 3 5456 2500

Fax: +61 3 5456 3300

Contact: David Elliott

Email: david@ellwaste.com.au

Hart, Peter

Consultant

Tel: +61 2 9673-667

Email: peter.hart@remondis.com.au

International Waste Limited (InterWaste)

Head Office: 10F Burrett Ave, Penrose, Auckland, New Zealand

Postal Address: PO Box 58832 Greenmount, Auckland, New Zealand

Tel: +64 9 273 1998

Fax: +64 9 273 1992

Contact: Lincoln Falconer

Email: lincoln@interwaste.co.nz

Web site: <http://www.interwaste.co.nz>

Medico Waste Disposal

325 Raglan Street, Sale VIC 3850 Australia

Postal Address: PO Box 1455, Sale VIC 3850 Australia

Tel: +61 3 5144 6059

Fax: +61 3 5143 1923

Contact: Glen Stephenson

Email: glen@medicoservices.com.au

Web site: <http://www.medicoservices.com.au>

MediCollect Australia Pty Ltd

1-7 Felspar Street, Welshpool, WA 6106 Australia

Postal Address: PO Box 213, Bentley WA 6102 Australia

Tel: +61 8 9356 5737

Fax: +61 8 9458 6174

Contact: John Stephenson or Jennifer Bensemenn

Email: john@medicollect.com.au or jennifer@medicollect.com.au

Web site: <http://www.medicollect.com.au>

Medismart/Transpacific Technical Services

(Medismart a Division of Transpacific Technical Services (NZ) Ltd)
12 Allens Rd, Greenmount, Auckland, New Zealand
Postal Address: PO Box 58-032, Greenmount, Auckland, New Zealand
Tel: +64 9 273 2800 (Direct)
Tel: +64 9 274 7963 (Main)
Mobile: 0064 275 826 179
Fax: +64 9 274 1065
Contact: Murray Lewis
Email: mlewis@transpac.co.nz

MediVac Limited

Postal Address: PO Box 7721 Baulkham Hills DC NSW 2153 Australia
Tel: +61 2 9894 7011
Fax: +61 2 9894 7558
Contact: Mark Butler
Email: mark.butler@medivac.com.au

Redlam Waste Services Pty Ltd

Postal Address: PO Box 2056, East Woonona NSW 2517 Australia
Tel: +61 2 4285 2555
Fax: +61 2 4285 3652
Contact: Rick Jones
Email: rick@redlam.com.au

SITA Environmental Solutions

Dandenong Facility: 64-84 Waterview Close, Dandenong South VIC 3175
Australia
Tel: +61 3 8795 2000
Fax: +61 39702 8022
Contact: Kathryn Feigan
Email: kathryn_feigan@sita.com.au
Welshpool Facility: 116 Kurnall Road, Welshpool WA 6106 Australia
Tel: +61 8 9458 4644
Fax: +61 8 9351 8030
Contact: Gordon Warren
Email: gordon_warren@sita.com.au
Web site: <http://www.sita.com>

Specialised Waste Treatment Services Pty Ltd

Cormorant Road, Kooragang NSW 2304 Australia
Postal Address: PO Box 1225, Castle Hill NSW 1765 Australia
Tel: +61 2 4928 4499
Mobile: 0438 270 623
Fax: +61 2 4910 9023
Contact: Miranda Ransome
Email: miranda@swts.com.au
Web site: <http://www.swts.com.au>

Spedding, Max

Consultant
Tel: +61 3 9589 2669
Mobile: 0400 880 677
Email: spedding@bigpond.net.au

SteriCorp Limited

Level 8, 470 Collins Street, Melbourne VIC 3000 Australia
Tel: +61 3 9629 7733
Fax: +61 3 9629 7455
Contact: Dan Daniels
Email: ddaniels@danielsinternational.com
Web site: <http://www.stericorp.com.au>

STI Clinical Waste Victoria Pty Ltd

2/140 Broderick Road, Corio VIC 3214.
Postal Address: PO Box 102, Lara VIC 3212 Australia
Tel: +61 3 5275 7277
Fax: +61 3 5275 7288
Contact: Hugh Parsons
Email: hughparsons@sweeneytodd.com.au
Web site: <http://www.sweeneytodd.com.au>

SULO MGB Australia Pty Ltd

123 Wisemans Ferry Road, Somersby NSW 2250 Australia
Postal Address: PO Box 1957, Gosford NSW 2250 Australia
Tel: +61 2 4348 8188
Fax: +61 2 4348 8128
Contact: John Kernahan
Email: j.kernahan@sulo.com.au
Web site: www.sulo.com.au

Sweeney Todd Waste Disposal Pty Ltd

2/140 Broderick Road, Corio VIC 3214 Australia
Postal Address: PO Box 102, Lara VIC 3212 Australia
Tel: +61 3 5275 7277
Mobile: 0419 324 086
Fax: +61 3 5275 7288
Contact: Judith Parsons
Email: sweeney@pipeline.com.au
Web site: www.sweeneytodd.com.au

Veolia Environmental Services

Postal Address: PO Box 105, Enfield Plaza SA 5085 Australia
Tel: +61 8 8260 2122
Fax: +61 8260 1000
Contact: Shayne Hovey
Email: shayne.hovey@veoliaes.com.au
Website: <http://www.veoliaes.com.au/>

Waste Audit and Consultancy Services Pty Ltd

1st floor, 24 Thomson Street, South Melbourne VIC 3205 Australia
Tel: +61 3 9645 0166
Mobile: 0418 397 375
Fax: +61 3 9645 0199
Contact: Pam Keating
Email: pam@wasteaudit.com.au

Membership of ANZCWMIG

Tier 1 membership is available to those who are actively participating in the management of clinical and related waste and who are members of the Group.

Tier 2 (Solutions Group), is available to those individuals or organisations that are directly involved in any aspect of the generation of clinical and related waste and/or have an interest in the management issues.

For information on the benefits of membership of ANZCWMIG and the procedures to apply for either Tier 1 membership or Solutions Group, please contact the ANZCWMIG Network Manager at 1st floor, 24 Thomson Street, South Melbourne VIC 3205 Australia or via email info@clinicalwaste.org Telephone toll free 1800 222 259 or from outside Australia +61 3 9645 0166.



Mission Statement

“To achieve consistency of industry practice through uniform guidelines on classification, handling, transportation, treatment and disposal of clinical and related waste in Australia and New Zealand. In achieving this, the waste generators, transporters, disposal and treatment facilities, along with the regulators of this industry, have a focused understanding of, and commitment to, the best practice required to ensure cost effective, safe and environmentally sound management of clinical and related wastes.”