

**GUIDELINE FOR REMOTE CLINICAL WASTE
INCINERATORS IN THE NORTHERN TERRITORY**

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1 Introduction and Background

1.1 Purpose

The purpose of the Guideline for Northern Territory Remote Clinical Waste Incinerators (Guideline) is to set out the minimum performance and operational requirements for remote health clinics that dispose of clinical and related waste by incineration.

Remote health clinics need a method to safely dispose of wastes generated from clinical procedures. This may involve either transport of wastes to a secure facility at a central location or local incineration using an appropriate incinerator that meets the requirements of this code.

Remote clinical waste incinerators which do not operate on commercial or fee for service are not required to be licensed under the *Waste Management and Pollution Control Act* (WMPCA). Notwithstanding, in accordance with section 12 of the WMPCA there is a general environmental duty to ensure that these remote clinical waste incinerators are operated in such a manner to prevent or minimise pollution or environmental harm, and reduce the amount of waste.

This Guideline specifies the requirements for disposal of waste in remote clinical waste incinerators which operate for less than nine hours per week and not on a commercial or fee for service basis. This guideline should be read in conjunction with the *Northern Territory (NT) Guideline for Disposal of Waste by Incineration*. In the case of any variations in requirements, the Guideline for Northern Territory Remote Clinical Waste Incinerators takes precedence.

1.2 Limitations

Facilities which dispose of clinical related waste by incineration on a fee for service basis are required to hold an environment protection licence and this Guideline therefore does not apply.

2 Definitions

Table 1. Definitions Relevant to Guideline

Term	Definition
Clinical and Related Waste (also referred to as Biohazardous Waste)	Clinical waste arises from, but is not limited to, medical, nursing, home healthcare, dental, veterinary, laboratory, pharmaceutical, teaching, podiatry, tattooing, body piercing, brothels, emergency services, blood banks, mortuary, crime/trauma scene remediation and other similar practices and/or any activity prescribed by a relevant regulatory authority. It also includes commercial practices/activities that manage what would be considered clinical waste as described in BWI (2010, Section 2.1). Related wastes are defined as wastes within the waste stream which constitute, or are contaminated with, cytotoxic drugs, chemicals or pharmaceuticals.
Environmental Nuisance	<p>environmental nuisance means:</p> <p>(a) an adverse effect on the amenity of an area that:</p> <ul style="list-style-type: none"> (i) is caused by noise, smoke, dust, fumes or odour; and (ii) unreasonably interferes with or is likely to unreasonably interfere with the enjoyment of the area by persons who occupy a place within the area or are otherwise lawfully in the area; or <p>(b) an unsightly or offensive condition caused by contaminants or waste.</p>
Commercial	Prepared, done, or acting with sole or chief emphasis on saleability, profit, or success; able to yield or make a profit.
Environmental nuisance	<p>Means</p> <p>(a) an adverse effect on the amenity of an area that:</p> <ul style="list-style-type: none"> i. is caused by noise, smoke, dust, fumes or odour; and ii. unreasonably interferes with or is likely to unreasonably interfere with the enjoyment of the area by persons who occupy a place within the area or are otherwise lawfully in the area; or <p>(b) an unsightly or offensive condition cause by contaminants or waste.</p>
Fee for Service	Fee for service arrangements are a subset of commercial operations. The payment of a specified price or rate to

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	access waste disposal facilities, where the price or rate is linked to the nature of the waste and the sort of facilities required to handle it.
Landfill	A waste facility used for the purpose of disposing of waste to land.
Operator	A worker; one employed or skilled in operating a machine, apparatus, or the like.
NT EPA	Northern Territory Environment Protection Authority
Qualified Sampler	A person who has training and experience in obtaining samples from the relevant environmental medium.
Remote	Refers to areas outside major regional population centres of the NT including Darwin, Palmerston and associated rural areas, Katherine, Tennant Creek, Alice Springs and Nhulunbuy.
WMPCA	Waste Management and Pollution Control Act

3 Relevant Legislation, Guidelines and Codes

3.1 Waste Management and Pollution Control Act

The objectives of the WMPCA is to protect, and where practicable restore and enhance the quality of, the Territory environment by:

- preventing pollution or the likelihood of pollution occurring
- avoiding and reducing the generation of waste
- increasing re-use and recycling of waste; and
- effectively managing waste disposal.

The Act also encourages ecologically sustainable development and facilitates implementation of national environment protection measures.

Section 12 of the WMPCA requires a person conducting an activity that causes or is likely to cause pollution resulting in environmental harm, or generates waste, to take all reasonable and practical measures to prevent or minimise the pollution or environmental harm, or reduce the amount of waste.

Section 14 of the WMPCA establishes a process for notifying the Northern Territory Environment Protection Authority (NT EPA) about incidents causing, or threatening to cause pollution.

Schedule 2 of the WMPCA requires an environment protection approval for construction (Part 1, Section 2) and a licence for ongoing operation (Part 2, Section 2) for the treatment or disposal of listed wastes on a commercial or fee for service basis at the premises. Listed wastes are defined in Schedule 2 of the *Waste Management and Pollution Control (Administration) Regulations*. Section 31 deals with the application for approvals and licences.

Under the WMPCA it is an offence to cause an environmental nuisance. Noise or odour adversely affecting the amenity of an area may be considered environmental nuisance.

3.2 Waste Management and Pollution Control (Administration) Regulations

The Waste Management and Pollution Control (Administration) Regulations (the Regulations) prescribe matters to give effect to the WMPCA and may include procedures and processes required for management, prevention, reduction, control, rectification or clean-up of pollution or environment harm resulting from pollution. The Regulations also provide for the establishment of fees and levies associated with licences and approvals, and may prescribe matters relation to design, installation and operation of equipment to appropriate manage wastes.

Schedule 2 to the Regulations establishes the listed wastes that are subject to environment approval/licensing requirements.

3.3 Other Legislation

Additional legislation that may apply to incineration of clinical waste activities are discussed in Appendix A.

3.4 Industry Code of Practice

In accordance with The Northern Territory Guideline for Disposal of Waste by Incineration, any operator of an incinerator in the Northern Territory should comply with the Industry Code of Practice for the Management of Clinical and Related Wastes (Industry Code).

The Industry Code is a voluntary commitment by all stakeholders to environmental best practice in the safe and cost effective, transportation, treatment and disposal of clinical and related waste.

Whilst the Industry Code focuses BioHazardous Waste, the advice, standards and best practice operations are relevant to the storage, treatment and disposal of other clinical and related wastes intended for incineration irrespective of the location of the incinerator or whether it operates on a commercial or fee for service basis or otherwise.

4 Minimum Operating Requirements for Remote Clinical Waste Incinerators

4.1 Existing NT Remote Clinical Waste Incinerators

The minimum operating requirements for remote clinical waste incinerators which exist as of 1 September 2018 and that operate less than 9 hours per week is specified in Table 2.

Remote clinical waste incinerators which exist as of 1 September 2018 must meet the design specifications for new incinerators (Table 3) within 5 years of commencement of this Guideline.

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Table 2. Minimum operating requirements for existing NT Remote Clinical Waste Incinerators

Minimum Separation Distance	All existing and new remote clinical waste incinerators shall be located a minimum of 60 metres (m) from any occupied premises used for residential, commercial, recreational or health purposes.
Minimum Stack Height	All existing and new remote clinical waste incinerators shall have a minimum stack height equal to twice the height of any building within a radius of 100 m and in any case not less than 7 m .
Minimum Operating Temperatures	All existing remote clinical waste incinerators shall have a minimum operating temperature of 450^o (degrees) C whenever clinical waste is being incinerated, and preferably operate at 850 ^o (degrees) C.
Other Minimum Requirements	<p>All existing and new clinical waste incinerators must have :</p> <ul style="list-style-type: none"> • Two chambers • Sufficient air supply to achieve efficient combustion of all wastes • A minimum retention time of 0.5 seconds • No impingement of stack exhaust gases onto building or sensitive sites. <p>Open burning in drums and pits is not permitted.</p>

4.2 New remote clinical waste incinerators

Any new remote clinical waste incinerators installed after 1 September 2018 must meet the design specifications outlined in Table 3.

Table 3. Design Specifications for New Incinerators

Component	Specification
Primary Chamber	at least 0.5 m ³ volume
Second Chamber	at least 0.5 m ³ volume
Retention time in secondary chamber	Minimum of 0.5 seconds
Temperatures in primary chamber	600 – 800 °C

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Temperatures in secondary chamber	900 – 1200 °C
Minimum exhaust gas velocity of	at least 7 m/sec
Minimum Stack Height	not less than 7 metres
Stack diameter	optimal 0.37m
Burn capacity	Able to burn up to 50 kg/hr
Test ports	2 ports that meet Australian Standards 4323.1 (AS4323.1)

4.3 General Operating Requirements

These general operating requirements apply to all existing and new incinerators.

4.3.1 Air Emissions

All air emissions discharged from the incinerator must comply with the in-stack concentrations for exhaust gas emissions outlined in Table 4.

Table 4. Summary of Allowable Exhaust Gas Emission Concentrations

Substance	Emission Limit (mg/m ³)	Stack Testing Requirements	Source
Particles (as TSP)	50	Dry, 7% O ₂	SEPP(AQM)(2001) POEO (2010, Group 5) POEO (2010, Group 6)
Hydrogen chloride	100	Dry, 7% O ₂	POEO (2010)
Fluoride compounds (as HF)	50	Dry, 7% O ₂	POEO (2010)
Sulfur dioxide (as SO ₂)	150	Dry, 11% O ₂	POEO sulfuric acid plants (2010) World Bank (1999) US EPA high value (2009)
Sulfuric acid or sulfur trioxide (as SO ₃)	100	Dry, 7% O ₂	SEPP(AQM)(2001) Average of SEPP and POEO POEO (2010, Group 6)
Arsenic	0.5	Dry, 11% O ₂	SEPP(AQM)(2001) Average of SEPP and World Bank EU (2000)
Cadmium	0.2	Dry, 7% O ₂	SEPP(AQM)(2001) Average of SEPP and POEO POEO (2010, Group 6)
Chromium (III)	0.5	Dry, 11% O ₂	EU (2000)

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Chromium (VI)	0.5	Dry, 11% O ₂	EU (2000)
Copper	0.5	Dry, 11% O ₂	EU (2000)
Lead	0.5	Dry, 11% O ₂	EU (2000)
Manganese	0.5	Dry, 11% O ₂	EU (2000)
Mercury	0.05	Dry, 11% O ₂	EU (2000)
Nickel	0.5	Dry, 11% O ₂	SEPP(AQM)(2001) Average of SEPP and EU EU (2000)
Antimony	0.5	Dry, 11% O ₂	SEPP(AQM)(2001) Average of SEPP and World Bank World Bank (1999)
Cobalt	0.5	Dry, 11% O ₂	EU (2000)
Thallium	0.05	Dry, 11% O ₂	EU (2000)
Vanadium	0.5	Dry, 11% O ₂	EU (2000)
NO _x (as NO ₂)	350	Dry, 7% O ₂	POEO (2010)
Dioxins / furans	0.1 ng/m ³	Dry, 11% O ₂ Measured as TEQ (Toxicity Equivalence)	Stockholm Convention on Persistent Organic Pollutants (2001)

Testing of air emissions from an incinerator must be undertaken at least once every 5 years, and preferably every 2 years. All sampling must be carried out in accordance with *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* by a qualified sampler in accordance with approved methods. Samples must be analysed at a laboratory with current National Association of Testing Authority (NATA) accreditation.

If emissions testing identifies that concentrations of any parameters exceed the emission limits outlined in Table 4, an investigation should be undertaken to determine the cause of the exceedance and identify remediation measures to ensure that future incineration meets the above air emission limits.

Any exceedance of the emissions criteria in Table 4 must be reported to the NT EPA within 24 hours of becoming aware that an exceedance has occurred.

4.3.2 Waste Residuals

Any solid residuals left following incineration, must be disposed of at a licenced waste disposal facility (e.g. landfill, listed waste disposal facility). Unburned clinical waste may be re-introduced into the primary chamber for further incineration.

Standard operating procedures for disposing of solid residual waste and unburned waste must be developed for each incinerator, with consideration of the recommended practices for handling of solid residuals outlined in the Industry Code.

4.3.3 Record of Operations and Maintenance

A written record shall be maintained of the date and time of starting and completion of incineration for every use of the incinerator, together with the nature and approximate weight of wastes incinerated, fuel type and use, and any operating conditions, such as incineration temperature and air supply.

4.3.4 Noise and Odour

The incinerator must be operated so it does not cause an environmental nuisance.

4.3.5 Two-Yearly Inspections

At two year intervals, each incinerator shall be inspected and maintained by a person with appropriate qualifications and experience to carry out that work. A record of the maintenance date, personnel and replacement parts shall be made in the record of operations and maintenance.

5 Standard Operating Procedures

Standard Operating Procedures for disposal of clinical waste by incineration must be developed by the Department of Health or non-Department of Health operator. Each individual incinerator should have its own Standard Operating Procedure. The Standard Operating Procedure should also include storage and transport of clinical waste intended for incineration. Consideration should be given to the Industry Code in developing those Standard Operating Procedures.

6 Training

All individual staff involved in the operation of remote clinical waste incinerators. A training package must be developed to ensure each incinerator is operated in such a manner to comply with the requirements of this guideline and in accordance the Standard Operating Procedures.

7 References

Biohazard Waste Industry of Australia and New Zealand, (2010) *Industry Code of Practice for the Management of Clinical and Related Wastes, 6th Edition*, Waste Management Association of Australia, available: http://www.wmaa.com.au/hidden/DBW/DBW_1006_CoP_6thEd.pdf Last accessed 11 January 2013

GHD, (2017) *Department of Health Remote medical clinical incinerator environmental testing Q16-0491, Final Report December 2017*.

GHD, (2016) NT EPA Clinical Waste Incineration Investigation, July 2016

National Association of Testing Authorities, Australia <https://nata.com.au/>

NT EPA (2013) *Guideline for Disposal of Waste by Incineration, November 2013 Version 2.0*

Waste Management and Pollution Control Act 2009 as in force 1 January 2013, Northern Territory Government, available: http://www.austlii.edu.au/au/legis/nt/consol_act/wmapca398/ Last accessed 10 January 2013

Appendix A Legislative Framework

Relevant international, national and Northern Territory conventions and legislation to incineration of clinical and related waste is listed below.

- Stockholm Convention
 - National Environment Protection Measures (Implementation) Act 1998
 - Work Health and Safety (National Uniform Legislation) Act 2011
 - Planning Act
 - Environmental Assessment Act
 - Public and Environmental Health Act
 - Additional NT legislation that may apply to incineration of hazardous and clinical waste (e.g. *Territory Parks and Wildlife Conservation Act*, *Biological Control Act*, *Heritage Act*, *Aboriginal Land Act*, *Aboriginal Land Rights (Northern Territory) Act 1976 (Cth)*, *Crown Lands Act*, *Soil Conservation and Land Utilisation Act*)