



NSW HEALTH DEPARTMENT

WATERLESS COMPOSTING TOILETS APPROVAL GUIDELINE

PART 3

LOCAL GOVERNMENT (APPROVALS) REGULATION 1993

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GLOSSARY

for the purposes of this document

batching or multi-batch system	a system using two or more alternating chambers.
blackwater	human excrement and matter contaminated by human excrement
chute	a vertical, unrestricted tube to convey human excrement to the composting chamber.
composted end product	human and domestic organic material which has undergone aerobic biological decomposition in the WCT and is available to be removed from the unit for disposal.
continuous system	a system with a single chamber which always contains composting material.
dry consistency	dry to touch, but having a moisture content of about 40 to 70%.
design rated capacity	manufacturer's designed capacity based on usage patterns.
greywater (sullage)	domestic wastewater excluding toilet waste.
humus	dark organic materials produced by decomposition of vegetable and animal matter.
manufacturer	the person, company or firm, and any authorised representative of the company or firm submitting the waterless composting toilet design for assessment by NSW Health.
minimum retention time	the minimum time period during which the waste is retained in the WCT and shall not be less than nine months.
minimum treatment time	a minimum period of time that allows the human and domestic organic matter to decompose prior to the commencement of the minimum test period.
minimum test period	the minimum period of time between the first test sample and third test sample which satisfy the performance criteria
peak capacity	manufacturer's designed maximum use rate.
single dwellings	includes dual occupancy dwellings.
thermotolerant coliforms	aerobic and facultative anaerobic, gram-negative, nonspore-forming, rod shaped bacteria, distinguished from nonfaecal coliform organisms by incubation at 44.5°C.
total test period	the period of time between commissioning of the WCT to the end of the minimum test period

wastewater	means liquid and solid human organic material generated by a domestic premises and includes both blackwater and greywater.
waterless composting toilet (WCT)	a device which receives and treats human and domestic organic matter using a biological degradation process. The only water used in a WCT is for cleaning or assisting the composting process. The toilet includes all pipes, apparatus, vents, trays, chutes and parts.

ABBREVIATIONS

The following abbreviations are used in this guideline:

AS/NZS	Australian Standard/New Zealand Standard
cfu	colony forming units
WMAC	Wastewater Management Advisory Committee
NATA	National Association of Testing Authorities
WCT	waterless composting toilet
JAS-ANZ	Joint Accreditation System of Australia and New Zealand

REFERENCED DOCUMENTS

Local Government Act, 1993
 Local Government (Approvals) Regulation, 1993
 AS 1260 *Unplasticized PVC (UPVC) pipes and fittings for sewerage applications*
 AS 1415 *Unplasticized PVC (UPVC) pipes and fittings for soil, waste and vent (SWV) applications*
 AS 1547 *Disposal systems for effluent from domestic premises*
 AS 3000 *Electrical installation - buildings structures and premises*
 AS 3500 *National Plumbing & Drainage Code*

PART ONE - GENERAL

1 SCOPE

This guideline sets out the minimum requirements for approval by the NSW Health Department (NSW Health) of waterless composting toilets (WCT) also known as humus closets and biological toilets, which treat human excreta and domestic organic matter from single dwellings. It is recommended that WCTs only be approved where an on-site wastewater system can be provided for the disposal or utilisation of greywater (sullage).

A manufacturer or a person who distributes plans of WCTs is expected to produce a specification for the WCT and place the WCT under a testing regime before approval may be granted by NSW Health. Requirements for manufactured WCTs and where WCTs are to be built according to distributed specification and plans for their erection are contained in Part Two of this guideline.

At present, persons who wish to design and build their own WCTs are required to comply with the requirements of Part Three of this guideline to obtain NSW Health approval. Regulatory reform proposals will no longer require NSW Health approval of home built WCTs and, when this occurs Part Three will then become a guideline protocol to assist local authorities in granting installation approval without reference to NSW Health.

It should also be noted that under the regulatory reform proposals that NSW Health approval will take the form of a certification process rather than an approval process. When this occurs the word 'certified' should substitute for the word 'approved' and for similar meanings in reference to an approval granted by NSW Health.

2 INTRODUCTION

Generally, under the Local Government (Approvals) Regulation, 1993, NSW Health has the responsibility to approve of a human waste treatment device. A local authority cannot legally approve of the installation of a WCT unless it is approved by NSW Health.

An approval by the Director-General is to facilitate an approval to install, construct or alter a human waste treatment device issued by the Local Authority under the provisions of Section 68, Local Government Act, 1993. An approval granted by the Director-General is issued to a specific WCT as a human waste treatment device produced by a specific manufacturer or where plans of a WCT are distributed.

At present all WCTs require NSW Health approval. Under proposed legislative reform to the Local Government (Approvals) Regulation, 1993, it will only be necessary for NSW Health to consider certification of those waste treatment devices of certain types which treat human excreta where they may be:

- c constructed on-site as a result of distribution of a standard design, or
- c manufactured and distributed irrespective of any commercial arrangements.

This means that after regulatory reform occurs, those WCTs which are designed and built by the owner/occupier of the premises will not require certification by NSW Health.

3 ROLE OF GOVERNMENT AGENCIES

3.1 LOCAL AUTHORITIES

The powers requiring local authorities to grant approval to construct and install a WCT on a particular

site are contained within Section 68, Part C - Management of Waste, Local Government Act, 1993, and Local Government (Approvals) Regulation 1993. This applies to all WCTs. **Appendix B** lists some suggested conditions of approval which can be used by the local authority.

Under Part Three of this guideline, local authorities are to conduct the design assessment procedure for home designed and built WCTs, and lodge the application with the local Public Health Unit for consideration of approval. Proposed regulatory reform will not require approval by the Public Health Unit of a home built WCT and Part Three will become a recommended protocol to assist local authorities in approving the installation of home designed and built WCTs.

The Local Government (Water, Sewerage and Drainage) Regulation, 1993 and the New South Wales Code of Practice for Plumbing and Drainage (which includes variations to the National Plumbing and Drainage Code AS 3500 - 1990) applies to all plumbing and related work associated with the installation, construction or modification of a WCT.

3.1.1 Local Council Wastewater Management Strategy

- C The Local Council should have a Wastewater Management Strategy for on-site domestic wastewater disposal/reuse. The document should include strategies for approval, requirements for maintenance, monitoring of WCTs, and requirements for removal and disposal of end products.
- C Persons qualified for evaluating the ongoing performance of the WCT may be: experienced manufacturer's accredited representatives; persons with qualifications in environmental health; or other persons deemed to be satisfactory to the Local Council.

3.1.2 Monitoring

There should be a monitoring system administered by the Local Council as follows:

- C The WCT and greywater systems should be evaluated by a suitably qualified person as outlined in section 3.1.1, one year after installation or upon change of ownership.
- C Subsequent monitoring inspections should be conducted by a suitably qualified person no less frequently than every 12 months.
- C This person should certify that the system is operating satisfactorily, and this certificate should be submitted to the Local Council.
- C If the system is operating unsatisfactorily, the deficiency should be rectified and the system re-inspected after six months, then yearly as indicated above.
- C If subsequent inspections reveal that the system is still operating unsatisfactorily after attempts to rectify the defects, the Local Council will need to determine whether the orders provisions under the Local Government Act should be invoked, or an alternate system(s) installed.
- C The Local Council should keep a register of all WCT approvals as required under section 113 of the Local Government Act, 1993. The record should include the following minimum information:
 - name and address of applicant
 - type of WCT to be installed (manufacturer and model or home-built)
 - maximum number of persons to be served by the WCT
 - location of WCT on property
 - date of approval.
- C The Local Council should also keep a record of the inspections carried out on each toilet and the results of the inspections.

The minimum criteria that should be addressed during inspections for ongoing performance monitoring for WCTs are listed in **Appendix C**.

3.2 NSW HEALTH DEPARTMENT

NSW Health is responsible for approval of the design of waste treatment devices in accordance with appropriate guidelines to enable local authorities to determine applications for approval to install such devices. NSW Health has established a Wastewater Management Advisory Committee (WMAC) which is responsible to the Department and Director-General to advise on domestic wastewater issues including the approval process and to produce appropriate guidelines. Membership includes representatives from the Department of Land and Water Conservation, Department of Local Government, NSW Health, the Department of Urban Affairs and Planning, the NSW EPA and the Australian Institute of Environmental Health.

In addition, the Public Health Units are responsible for determining compliance with NSW Health guidelines, disseminating information and liaising with local authorities.

All applications for manufactured WCTs should be forwarded to the Manager, General Environmental Health, NSW Health Department, PO Box 798, Gladesville NSW 2111.

For home-built WCTs, the local authority submits the application from the owner to the local Public Health Unit for consideration of approval by the Medical Officer of Health. After regulatory reform, NSW Health approval for home designed and built WCTs will not be required.

PART TWO - MANUFACTURED WATERLESS COMPOSTING TOILETS

4 APPROVAL REQUIREMENTS

- 4.1 An existing approval issued by the Director-General of NSW Health to a WCT manufacturer for a particular model, will be revoked on 30 July 1998, unless the Department has been notified of the commencement of operation of the test units for approval purposes as outlined in this guideline. Subsequent failure to then comply with this guideline will result in withdrawal of the approval.
- 4.2 All design approvals issued by NSW Health subsequent to adoption of this guideline will comply with the requirements of this document.

5 APPLICATION CRITERIA

A preliminary application may be submitted for comment and clarification prior to commencement of any tests and submission of a formal application.

- 5.1 All applications for design assessment shall be on the form attached as **Appendix A** and forwarded to the Manager, General Environmental Health, NSW Health Department, PO Box 798, Gladesville NSW 2111.
- 5.2 The prescribed fee, if any, shall be attached.
- 5.3 The application is to provide the following supporting documentation.
- 5.3.1 An evaluation report completed by an independent testing agency detailing the testing methods used and performance against the test criteria, the type of use intended for the WCT (eg continuous, intermittent (holiday)), and the security arrangements adopted to ensure testing integrity.
- 5.3.2 Documentation showing that the **independent** assessment, monitoring and testing agency is a third party quality management system certification body accredited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ) or equivalent.
- 5.3.3 Documentation that the laboratories used for bacteriological determinations are National Association of Testing Authorities (NATA) registered.
- 5.3.4 Documentation of the number of persons which the WCT is designed to serve as indicated by usage during the testing period.
- 5.3.5 The system's capacity (volume) including starter base material, the proposed annual usage, bulking material and toilet paper, must be calculated.
- 5.3.6 Certification of the structural adequacy of the vessel used in the WCT.
- 5.3.7 A statement of the warranty and guaranteed service life of the WCT and components.
- 5.3.8 A copy of the manual which is to cover installation, maintenance and operation and servicing of the WCT. (See section 10)

5.3.9 A copy of the recommended service report sheet.

5.3.10 Three copies of plans to scale on A3 paper, dimensioned and accompanied by a listing of all components and component details, including name, model, size description, function, material of manufacture and location in the WCT. All components are to be shown.

5.3.11 Details of the conformance to the process design criteria.

6 PROCESS DESIGN CRITERIA

6.1 The WCT shall be designed to incorporate aerobic biological treatment and easy hygienic collection of end product. The biological process shall involve die-off of pathogenic organisms, be free from offensive odours and produce an end product of humus like consistency and appearance.

6.2 WCTs shall be designed and manufactured to ensure that:

c the WCT produces a composted end product when installed and operated according to the manufacturer's instructions and this guideline.

c the WCT does not allow human and domestic organic material which has not been fully composted to contact any person, or spill from the WCT, during operation, maintenance, removal, or cleaning.

c the WCT or the processes within the WCT are not adversely affected by the environment and conditions such as temperature, humidity, gases or acids (from the composting process), or sunlight, or by the carrying out of specified cleaning procedures.

6.3 The WCT shall be designed to receive human excrement and domestic organic matter. Greywater shall be excluded from the WCT.

6.4 The WCT shall be designed to contain all composted end product and untreated or partially treated human excrement and domestic organic material. It shall also be designed to prevent the deposition of inadequately treated material near any area in the treatment chamber which is used for the removal of the end product. The minimum retention time shall be nine months.

6.5 The WCT shall be capable of producing a composted end product which is innocuous, free from offensive odours, of a dry consistency (refer to glossary) and which complies with the microbiological criteria specified in Table 1 of this guideline.

6.6 The device shall be capable of maintaining wastes within a moisture range of 40% to 75%.

6.7 For domestic WCTs the maximum design capacity which will be approved by NSW Health shall be for ten persons or its equivalent average yearly usage (as stipulated by the manufacturer). Approval may only be granted for the actual number of persons used in the test. The WCT shall be designed to perform with full or part time usage, unless specified by the manufacturer.

6.8 The WCT should be of an adequate size to provide for the stabilization of wastes under a clearly specified design loading rate. The system's capacity (volume) must be calculated and information should include the following breakdown:

6.8.1 Loading:

- Starter base material (m³) / percentage of system capacity _____
- Human waste (m³) / percentage of system capacity _____
- Bulking materials (m³) / percentage of system capacity _____
- Toilet paper (m³) / percentage of system capacity _____

Total loading _____

System's waste volume capacity (not overall size) (m³) _____

Loading as a percentage of system capacity _____%

6.8.2 Carbon/nitrogen ratio

The manufacturer should provide calculations to demonstrate the nominal amount of suggested bulking material required to achieve a carbon/nitrogen ratio of 14, for the following design assumptions:

Faeces	6% nitrogen	C/N = 7
Urine	16% nitrogen	C/N = 1.

6.9 Other supporting information should include:

- c how ambient temperature, elevation and humidity affects the system; and
- c how human and domestic organic material volume is reduced.

6.10 The WCT shall be designed to provide for adequate aeration of the composting pile to assist in the composting process.

6.11 The manufacturer must detail whether the WCT is likely to produce a liquid component and how it is proposed to dispose of the liquid, supported by plans of any overflow to disposal systems, where applicable.

7 CONSTRUCTION REQUIREMENTS

7.1 GENERAL

7.1.1 The WCT shall be clearly and permanently marked with the manufacturer's name or trademark, model identification, month and year of manufacture, and capacity of the WCT, which should remain clearly visible after installation.

7.1.2 Where separate chambers are used for the production of the composted end product on a rotational basis, a panel on the outside of the WCT shall be provided displaying the number of chambers and the last dates the chambers were filled and emptied.

7.1.3 The WCT shall be continuously vented through a vent pipe. The venting system and connections shall be constructed according to the manufacturer's instructions and AS 3500.2, and shall be independent of other household venting systems. All vents shall be designed to prevent flies and other insects from entering the treatment chamber.

- 7.1.4 The WCT shall be designed and constructed such that the blockage of vents or leakage of liquids through other than standard discharge orifices does not occur.
- 7.1.5 The WCT shall be manufactured to prevent entry of insects and vermin, when installed and operated according to the manufacturer's instructions. The room or building in which the WCT is contained should be rendered fly proof.
- 7.1.6 Components in which biological activity is intended to occur should be insulated, heated, or otherwise protected from low temperature conditions, where recommended by the manufacturer, in order to maintain the stored wastes at temperatures conducive to aerobic biological decomposition (20°C-55°C).
- 7.1.7 The distance or air space within a composting device, between the upper surface of the seat and the untreated waste, shall not normally be less than 400 mm. If the distance or air space is not provided, there shall be a cleanable barrier and a levelling device installed to preclude contact with untreated waste.
- 7.1.8 If operation of the WCT requires periodic raking of the composting pile, the WCT is to be designed and constructed to allow raking to occur so that human contact with the compost heap does not occur.
- 7.1.9 The largest dimension at the narrowest part of the toilet pedestal shall not exceed 190 mm.
- 7.1.10 The internal surfaces of the chute and any other accessible surfaces of the WCT shall be capable of being easily cleaned without chemical agents.
- 7.1.11 Waste entry chutes shall be provided with tightly closing lids.
- 7.1.12 The WCT shall be free of hazards which could cause injury to any persons installing, servicing or using the WCT.

7.2 STRUCTURAL SOUNDNESS

- 7.2.1 The design of the composting tank or chamber shall take into consideration the following aspects in relation to transportation, installation and operation, and is to be certified by a structural engineer:
 - c internal and external pressures including hydrostatic and geotechnical pressures when either full or empty
 - c mass of tank and contents
 - c localised loads acting on the supports, lugs and/or other attachments and on internal baffles and ducting
 - c normal loads applied during transport and installation
 - c fatigue
 - c soil conditions
 - c corrosive environments
 - c ground anchorage.

7.3 WATERTIGHT INTEGRITY

WCTs and component parts shall be manufactured to preclude infiltration of groundwater or surface water, and prevent escape of liquids through other than designated openings, when installed according to the manufacturer's instructions.

7.4 MATERIALS

7.4.1 All metal components shall be of stainless steel or other non-corroding material unless adequately protected against corrosion to satisfy the service life of the component.

7.4.2 All plastics, perishable components and any other material used in the WCT which is subject to exposure to ultra-violet radiation or an adverse chemical or biological environment shall be able to retain their integrity under normal operating conditions to satisfy the service life of the component.

7.4.3 Where plastic pipes and pipe fittings are used they shall be UPVC complying with AS 1260 or AS 1415.

7.5 MECHANICAL EQUIPMENT

All mechanical equipment shall be suitable for continuous and intermittent operation.

7.6 ELECTRICAL EQUIPMENT

7.6.1 All electrical equipment shall be suitable for continuous and intermittent operation.

7.6.2 All the electrical components used in the installation for and incidental to the WCT, shall be in accordance with AS 3000 *Electrical installation - buildings structures and premises*.

7.7 NOISE

The maximum permissible noise level with all equipment operating simultaneously eg fans, shall be less than or equal to 40 dB measured on fast response at a distance of 1m from the nearest item of noise emitting equipment.

7.8 ACCESS

7.8.1 The WCT shall have ready access, without any requirement for major dismantling of component parts, to the waste storage chamber, and removal chamber if included, to enable:

- c retrieval of foreign objects or matter which may enter the WCT
- c convenient periodic inspection, raking, turning or removal of waste as may be required by the design
- c ease of applying water or bulking material as may be required by the design
- c accessibility for repairs to the inside.

7.8.2 The WCT shall not be buried due to the need to maintain full access to the unit and provide appropriate drainage from the unit.

7.8.3 Component parts subject to malfunction, wear, or requiring cleaning shall be easily accessible for inspection, cleaning, repair, or replacement.

7.8.4 Where fans, air movement devices and heating elements are included in the installation, access shall be provided to facilitate replacement without coming into direct contact with composting material.

7.9 REMOVAL OF END PRODUCT

7.9.1 The WCT shall be designed to allow the removal of the end product and the cleaning of any liquid separation grates or filter mediums.

7.9.2 The access door for the removal of composted end product from the WCT shall be capable of being kept closed and child-proof. It must not be practical to remove humus through the toilet chute under normal operating conditions.

7.9.3 The WCT shall be designed to ensure that on removal of the end product, incidental contamination from freshly deposited faeces or urine will not occur.

8 WARRANTY AND GUARANTEED SERVICE LIFE

8.1 All metal fittings, fasteners and components of the WCT other than any fans or motors shall have a service life of at least 15 years, that is, having the ability to reliably comply with the test criteria for the period stated.

8.2 All mechanical and electrical parts shall have a minimum service life of 5 years and a minimum warranty period of 1 year.

8.3 The WCT shall have a minimum warranty period of 3 years during which all labour and materials shall be supplied free of cost by the manufacturer other than those referred to in 8.2.

9 QUALITY CONTROL

A manufacturer but not a person who produces a standard design for distribution of a WCT design shall obtain product quality assurance to the StandardsMark Quality Assurance Program or equivalent.

10 MANUALS

A manual(s) shall be supplied and submitted by the manufacturer for approval, and shall incorporate the following information:

10.1 INSTALLATION

C a full description of major mechanical and electrical component parts.

C instructions to consider location of the WCT in a well-vented area, protection of WCTs, air hoses and air intakes from snow, ice or water vapour accumulations.

C An arrangement using diagrams of pipework, ducting and electrical components to AS 3000 (if applicable).

10.2 USERS INSTRUCTIONS FOR OPERATION & MAINTENANCE

- C overview of the WCT and its intended use (eg continuous, intermittent (holiday), number of people served).
- C principle and function of operation.
- C start up procedure.
- C type of bulking material required.
- C frequency and quantity of bulking material required.
- C routine maintenance procedures.
- C public health considerations.
- C safety information when raking composting material within the WCT (if applicable).
- C minimum retention time before end product is removed.
- C parts list with each part numbered and identified on an illustration, photograph or print.
- C user responsibilities.
- C warranty and service life of parts and of the whole unit.

10.3 TROUBLE SHOOTING AND SIGNS OF FAILURE

Directions are to include a list of signs of failure and suitable responses for householders. To include at least the following:

- C signs indicating that additional bulking agents should be added.
- C rectification of odours.
- C signs indicating liquid build-up in the chamber.
- C insect control.

10.4 DISPOSAL

- C a description of the method of disposal of the excess liquid.
- C a safe and reliable method for removal and handling of end product materials shall be outlined according to the conditions of approval provided by the NSW Health Department.

10.5 SERVICE SHEET

- C Service sheet for use by service technicians

10.6 CONTACT

- C A contact name and number for the company to deal with emergencies and regular maintenance enquiries.

11 TEST CRITERIA

Compliance testing shall be undertaken in accordance with this section. Additional testing may be required when modifications are made to designs which have previously received approval under this guideline.

11.1 TEST SITE CRITERIA

- 11.1.1** Two test sites are to be chosen for evaluation of the WCT. The sites shall be chosen so as to reflect different climatic site conditions. Reports outlining performance of WCTs sited in other states or territories shall be acceptable provided that all requirements of this guideline are fulfilled.

Note: Climatic variables such as temperature and humidity (moisture

content) are critical factors which can affect and/or influence the composting process. Therefore, the working parameters relative to the composting process should be stated.

11.1.2 The test site shall be occupied by no more than 10 persons when a domestic WCT is under test. The WCT shall be loaded at the design rated capacity. That is, the number of persons in permanent occupancy shall be the maximum number of persons for which the closet is approved.

11.1.3 If tested in NSW written agreement from the NSW Health Department is to be obtained for the testing site of a WCT.

11.1.4 If tested in NSW the Local Authority's approval for the test site must be gained. The Local Authority may apply site conditions as considered necessary.

11.2 TESTING REQUIREMENTS

11.2.1 The WCT shall be installed in accordance with the manufacturer's instructions and specifications and in accordance with building requirements specified by the Local Authority. If an existing unit is submitted for testing, the unit requires to be certified that it is constructed and installed in accordance with the manufacturer's instructions.

11.2.2 During testing, the WCT shall be operated and maintained in accordance with the manufacturer's instructions. The WCT is to receive both faeces and urine during the whole of the evaluation period.

11.2.3 All compliance checking, monitoring, sampling and analysis is to be performed by a third party quality management system certification body accredited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ) and at the cost of the applicant. Sampling and analysis may be performed by a laboratory registered by NATA for that purposes.

11.2.4 Access to the WCT by the manufacturer or their authorized representative shall be controlled by the testing agency. Unannounced visits to the test site shall be made by testing agency personnel at periodic intervals during the testing period.

11.2.5 An existing installation selected for testing shall be restored to a condition representative of a new installation prior to commissioning.

11.2.6 Operation during the test period should be in accordance to the manufacturer's instructions and will be carried out by the occupier of the premises.

11.2.7 An operating manual and checklist is to be provided for the use of the occupier of the premises.

11.2.8 A record of usage during a minimum three month period is to be kept, and shall be considered representative of use during the testing period. *Usage* refers to deposition of both human faeces and urine. In addition a log of the number of occupants on the premises is to be kept on a weekly basis for the whole of the test period.

11.2.9 If at the end of the test period the WCT has not met the performance criteria, the manufacturer can either retest the WCT or will be obliged to remove the WCT and to restore the premises to pre-test condition or to the satisfaction of the owner of the premises and the local authority.

12 END PRODUCT SAMPLING

12.1 REQUIREMENTS

End product sampling should be undertaken as follows.

- c Disposable gloves and a disposable dust mask shall be worn while collecting the sample.
- c All samples shall be taken directly from the compost producing chamber. Samples must consist of the treated material and not the original bulking material.
- c All samples are to be placed in sterile containers and labelled.
- c Each sample is to be assessed for odour once the sample has been removed from the vicinity of the compost closet.
- c The minimum number of samples to be taken at each testing event is three (3).
- c The minimum weight of each sample is to be 100 grams.

12.2 SAMPLING LOCATIONS

12.2.1 Batching system (alternating chambers) From the chamber containing the end product, take the samples from about the centre of the pile at a point one quarter of the way up the height of the pile.

12.2.2 Continuous system From the base of the pile at the chamber clean out hatch.

13 PERFORMANCE CRITERIA

The following performance conditions shall apply.

13.1.1 Batching system: Approval may be recommended when at least two separate batch chambers meet the performance criteria specified in Table 1 for three consecutive testing events taken at three monthly intervals.

13.1.2 Continuous system: Approval may be recommended when the performance criteria specified in Table 1 are satisfied for three consecutive testing events taken at three monthly intervals.

13.1.3 Rated capacity: WCTs shall be approved for the usage rate used during the total testing period.

The performance test criteria for WCTs are presented in Table 1.

Table 1 - Performance criteria

Parameter	Performance criteria
Odours	The WCT shall not give rise to offensive odours at any time at the following locations or during the following circumstances:

Prior to testing - submission and discussions with NSW Department of Health, Manager, General Environmental Health and local Public Health Unit. Clarification or enquiries regarding documents required for approval. Initial agreement on site (subject to Local Authority approval).

Approval Application

Details specified in Section 5

16 APPROVAL CONDITIONS

16.1 The approval may be granted subject to conditions and any approval granted under this guideline shall be for a period of five years.

16.2 At the anniversary of the approval date the manufacturer shall provide a list of all WCT installations within the state. A minimum of one and a maximum of 10% of installations shall be randomly chosen by NSW Health for additional testing. The WCTs selected are to be assessed to determine their compliance with the performance criteria. Sampling is to be performed by an independent agency and all analysis is to be determined by a NATA registered laboratory at the cost of the manufacturer.

17 REMOVAL AND DISPOSAL OF END PRODUCTS

17.1 REMOVAL OF COMPOST BY THE HOUSEHOLDER

Removal of the compost should be carried out in accordance with the following:

- c the minimum composting period prior to compost removal shall be as specified on the NSW Health Department approval. A statement to that effect must be included in the owner/operators manual.
- c the composted material is to be disposed of by burial within the confines of the premises in soil which is not intended to be used for the cultivation of vegetables or used in pastures where animals may graze. The minimum cover of soil over the composted material is 100 mm.
- c composted material shall only be removed from the WCT during normal operation, through the access door provided for that purpose.
- c disposable gloves and a disposable dust mask shall be worn by the person removing the compost from the WCT.
- c material which has only been partially composted shall be removed from the WCT subject to the written consent of the Local Authority, which may issue instructions as to who may remove the material and the method of disposal of the material. Removal off-site requires the approval of the Local Authority.

17.2 DISPOSAL OF END PRODUCTS

17.2.1 Excess liquid from the WCT shall be disposed by sub-surface methodology in accordance with AS/NZS 1547.

17.2.2 The composted end product shall be disposed of according to the above requirements and any additional Local Authority requirements.

PART THREE - HOME-BUILT WATERLESS COMPOSTING TOILETS

18 APPROVAL REQUIREMENTS

A home-built waterless composting toilet (WCT) is one which is designed by the home owner or occupier and constructed on-site and **is not manufactured for sale nor is the result of plans which are distributed commercially.**

For home-built WCTs, Local Authorities conduct the design assessment in accordance with this guideline, and lodge the application with the local Public Health Unit for consideration of approval of the design (until amendment of Part 3, Local Government (Approvals) Regulation, 1993 when NSW Health approval will not be required.)

All approvals issued by the Local Authority shall be conditional approvals, whereupon final approval will be provided once the system is demonstrated to perform to the requirements of this document.

19 APPLICATION CRITERIA

19.1 All applications for a conditional approval to install a home-built WCT shall be forwarded to the Local Authority. The Local Authority shall carry out the design assessment in accordance with this guideline, and lodge the application with the local Public Health Unit for consideration of approval of the design (until amendment of Part 3, Local Government (Approvals) Regulation, 1993 when NSW Health approval will not be required).

19.2 The application is to provide the following supporting documentation:

- c documentation of the number of persons which the WCT is designed to serve as indicated by usage during the testing period.
- c a copy of a householders reference manual outlining installation/construction, operation and maintenance of the WCT.
- c three copies of plans to scale on A3 paper, dimensioned and accompanied by a listing of all components and component details, including name, size, description, function, building materials and location in the WCT. All components are to be shown.
- c any additional information required by the local authority.

20 PROCESS DESIGN CRITERIA

20.1 The WCT shall be designed to incorporate aerobic biological treatment and easy hygienic collection of end product. The biological process shall involve die-off of pathogenic organisms, be free from offensive odours and produce an end product of humus like consistency and appearance.

20.2 WCTs shall be designed and built to ensure that:

- c the WCT produces a composted end product.
- c the WCT does not allow human and domestic organic material which has not been fully composted to contact any person, or spill from the WCT, during operation, maintenance, removal, or cleaning.
- c the WCT or the processes within the WCT are not affected adversely by the

environment and conditions such as temperature, humidity, gases or acids (from the composting process), or sunlight, or by the carrying out of specified cleaning procedures.

c the WCT is free of hazards which could cause injury to any persons installing, servicing or using the WCT.

20.3 The WCT shall be designed to receive human and domestic organic matter. Greywater shall be excluded from the WCT.

20.4 The WCT shall be designed to contain all composted end product and untreated or partially treated human and domestic organic material. It shall also be designed to prevent the deposition of inadequately treated material near any area in the treatment chamber which is used for the removal of the end product.

20.5 The WCT shall be capable of producing a composted end product which is innocuous, free from offensive odours, of a dry consistency (refer to glossary) and which complies with the microbiological criteria specified in Table 1 of this guideline.

20.6 The device shall be capable of maintaining wastes within a moisture range of 40%-75%.

20.7 The design capacity must not exceed that required for regular use by ten persons.

20.8 The WCT should be of an adequate size to provide for the stabilization of wastes under a clearly specified design loading rate. The system's capacity (volume) must be calculated and information should include the following breakdown:

20.8.1 Loading:

- Starter base material (m³) / percentage of system capacity _____
- Human waste (m³) / percentage of system capacity _____
- Bulking materials (m³) / percentage of system capacity _____
- Toilet paper (m³) / percentage of system capacity _____

Total loading _____

System's waste volume capacity (not overall size) (m³) _____

Loading as a percentage of system capacity _____%

20.8.2 Carbon/nitrogen ratio

The manufacturer should provide calculations to demonstrate the nominal amount of suggested bulking material required to achieve a carbon/nitrogen ratio of 14, for the following design assumptions:

Faeces	6% nitrogen	C/N = 7
Urine	16% nitrogen	C/N = 1.

- 20.9** The WCT shall be designed to provide for adequate aeration of the composting pile to assist in the composting process.
- 20.10** The owner/builder must detail whether the WCT is likely to produce a liquid component and how it is proposed to dispose of the liquid, supported by plans of any overflow to disposal systems (AS 1547), where applicable.

21 CONSTRUCTION REQUIREMENTS

21.1 GENERAL

- 21.1.1** Where separate chambers are used for the production of the composted end product on a rotational basis, a panel on the outside of the WCT shall be provided displaying the number of chambers and the last dates the chambers were filled and emptied.
- 21.1.2** The WCT shall be continuously or passively vented through a vent pipe. All vents shall be designed to prevent flies and other insects from entering the treatment chamber.
- 21.1.3** The WCT shall be designed and constructed such that the blockage of vents or leakage of liquids through other than standard discharge orifices does not occur.
- 21.1.4** The WCT shall be manufactured to prevent entry of insects and vermin. The room or building in which the WCT is contained should be rendered fly proof.
- 21.1.5** Components in which biological activity is intended to occur should be insulated, heated, or otherwise protected from low temperature conditions where required, in order to maintain the stored wastes at temperatures conducive to aerobic biological decomposition (20°C-55°C).
- 21.1.6** The distance or air space within a composting device, between the upper surface of the seat and the untreated waste, shall not normally be less than 400 mm. If the distance or air space is not provided, there shall be a cleanable barrier to preclude contact with untreated waste and a levelling device shall be provided.
- 21.1.7** If operation of the WCT requires periodic raking of the composting pile, the WCT is to be designed and constructed to allow raking to occur so that human contact with the compost heap does not occur.
- 21.1.8** The internal diameter of the pedestal chute shall not be greater than 190 mm.
- 21.1.9** The internal surfaces of the chute and any other accessible surfaces of the WCT shall be capable of being easily cleaned without chemical agents.
- 21.1.10** Waste entry chutes shall be provided with tightly closing lids.

21.2 STRUCTURAL SOUNDNESS

The design of the composting chamber of the home-built WCT shall take into consideration:

- c internal and external pressures including hydrostatic and geotechnical pressures

- when either full or empty
- C mass of tank and contents
- C baffles and ducting
- C fatigue
- C soil conditions
- C corrosive environments
- C ground anchorage.

The structural soundness shall be assessed by a structural engineer and a certificate submitted to the Local Authority.

21.3 WATERTIGHT INTEGRITY

WCTs and component parts shall be manufactured to preclude infiltration of groundwater or surface water, and prevent escape of liquids through other than standard openings when installed.

21.4 MATERIALS, MECHANICAL & ELECTRICAL EQUIPMENT

Home-built WCTs shall be constructed to comply with the following.

- 21.4.1** All metal components shall be of stainless steel or other non-corroding material unless adequately protected against corrosion to satisfy the service life of the component.
- 21.4.2** All plastics, perishable components and any other material used in the WCT which is subject to exposure to ultra-violet radiation or an adverse chemical or biological environment shall be able to retain their integrity under normal operating conditions to satisfy the service life of the component.
- 21.4.3** Pipes and pipe fittings shall be UPVC.
- 21.4.4** All mechanical equipment shall be suitable for continuous and intermittent operation.
- 21.4.5** All electrical equipment shall be suitable for continuous and intermittent operation, and shall comply with AS 3000 *Electrical installation - buildings structures and premises*.
- 21.4.6** The maximum permissible noise level with all equipment operating (where relevant eg fans) shall be less than or equal to 40 dB measured on fast response at a distance of 1m from the nearest item of noise emitting equipment.

21.5 ACCESS

21.5.1 The WCT shall have ready access, without any requirement for major dismantling of component parts, to the waste storage chamber, and removal chamber if included, to enable:

- C retrieval of foreign objects or matter which may enter the WCT
- C convenient periodic inspection, raking, turning or removal of waste as may be required by the design

- C ease of applying water or bulking material as may be required by the design
- C accessibility for repairs to the inside.

21.5.2 The WCT shall not be buried due to the need to maintain full access to the unit and provide appropriate drainage from the unit.

21.5.3 Component parts subject to malfunction, wear, or requiring cleaning shall be accessible for inspection, cleaning, repair, or replacement.

21.6 REMOVAL OF END PRODUCT

21.6.1 The home-built WCT shall be designed to allow the removal of the end product and the cleaning of any liquid separation grates or filter mediums.

21.6.2 The access door for the removal of composted end product from the WCT shall be capable of being kept closed and child-proof. It must not be practical to remove humus through the toilet chute under normal operating conditions.

21.6.3 The home-built WCT shall be designed to ensure that on removal of the end product, incidental contamination from freshly deposited faeces or urine will not occur.

22 REFERENCE MANUAL

The owner/operator must indicate to Council a sound understanding of the principles of home composting of human and domestic organic matter, and the design, maintenance, and rectification of problems which may arise with the use of the WCT, by way of producing a reference manual. The manual is to include the following information:

22.1 DESIGN AND INSTALLATION

- C a full description of major mechanical and electrical component parts.
- C an arrangement using diagrams of pipework, ducting and electrical components to AS 3000 (if applicable).

22.2 USERS INSTRUCTIONS FOR OPERATION AND MAINTENANCE

- C overview of the WCT and its intended use (eg continuous, intermittent (holiday), number of people served).
- C principle and function of operation.
- C start up procedure.
- C type of bulking material required.
- C frequency and quantity of bulking material required.
- C routine maintenance procedures.
- C public health considerations.
- C safety information when raking composting material within the WCT (if applicable).
- C minimum retention time before end product is removed.
- C parts list with each part numbered and identified on an illustration, photograph or print.
- C user responsibilities.

22.3 TROUBLE SHOOTING AND SIGNS OF FAILURE

Directions are to include a list of signs of failure and suitable responses for householders. To include at least the following:

- C signs indicating that additional bulking agents should be added.
- C rectification of odours.
- C signs indicating liquid build-up in the chamber.
- C insect control.

22.4 DISPOSAL

- C a description of the method of disposal of the excess liquid.
- C a safe and reliable method for removal and handling of end product materials shall be outlined.

23 TEST CRITERIA

Compliance testing shall be undertaken in accordance with this section.

23.1 TEST SITE CRITERIA

23.1.1 The Local Authority's concurrence for the test site must be gained. The Local Authority may apply site conditions as considered necessary.

Note: Climatic variables such as temperature and humidity (moisture content) are critical factors which can affect and/or influence the composting process. Therefore, the working parameters relative to the composting process should be stated.

23.1.2 The WCT must be operated for regular use by no more than 10 persons or the equivalent average yearly usage.

23.1.3 The WCT must not be buried due to the need to maintain full access to the unit and appropriate drainage from the unit.

23.2 TESTING REQUIREMENTS

23.2.1 The WCT shall be installed in accordance with building requirements specified by the Local Authority.

23.2.2 The WCT is to receive both faeces and urine during the whole of the trial period.

23.2.3 All sampling of the end product is to be conducted by a NATA registered or similar laboratory, or by other persons acceptable to the Local Authority.

23.2.4 All analysis of the end product is to be conducted by a NATA registered or similar laboratory.

23.2.5 If at the end of the test period the home-built WCT has not met the performance criteria, the owner/operator will be obliged to make rectification work to the WCT and undergo a further trial period, or to remove the WCT and to restore the premises to pre-test condition.

24 END PRODUCT SAMPLING

24.1 REQUIREMENTS

End product sampling should be undertaken as follows:

- C disposable gloves and a disposable dust mask shall be worn while collecting the sample.
- C all samples shall be taken directly from the compost producing chamber. Samples must consist of the treated material and not the original bulking material.
- C all samples are to be placed in sterile containers and labelled.
- C each sample is to be assessed for odour once the sample has been removed from the vicinity of the compost closet.
- C the minimum number of samples to be taken at each testing event is three (3).
- C the minimum weight of each sample is to be 100 grams.

24.2 SAMPLING LOCATIONS

24.2.1 Batching system (alternating chambers) From the chamber containing the end product, take the samples from the centre of the pile at a point one quarter of the way up the height of the pile.

24.2.2 Continuous systems From the base of the pile at the chamber clean out hatch.

25 PERFORMANCE CRITERIA

The performance test criteria for home-built WCTs are as presented in Section 13, Table 1 of Part Two of this guideline.

The approval for continued operation may be granted by the Local Authority for a five year period subject to conditions. The following conditions shall be applied to all approvals.

25.1.1 Batching system Approval may be recommended when at least two separate batch chambers meet the performance criteria specified in Table 1 (Section 13, Part Two) for three consecutive sampling events at three monthly intervals.

25.1.2 Continuous system Approval may be recommended when the performance criteria specified in Table 1 (Section 13, Part Two) are satisfied for three consecutive three monthly periods.

26 REMOVAL AND DISPOSAL OF COMPOST AND END PRODUCTS

26.1 REMOVAL OF COMPOST BY THE HOUSEHOLDER

Removal of the compost should be carried out in accordance with the following.

- C the minimum composting period shall be as specified by the Local Authority approval. A statement to that effect must be included in the owner/operators manual.
- C the composted material is to be disposed of by burial within the confines of the premises in soil which is not intended to be used for the cultivation of vegetables or used in pastures where animals may graze. The minimum cover of soil over the

- composted material is 100 mm.
- C composted material shall only be removed from the WCT during normal operation and through the access door provided for that purpose.
- C disposable gloves and a disposable dust mask shall be worn by the person removing the compost from the WCT.
- C material which has only been partially composted shall be removed from the WCT subject to the written consent of the Local Authority, which may issue instructions as to who may remove the material and the method of disposal of the material. Removal off-site requires the approval of the Local Authority.

26.2 DISPOSAL OF END PRODUCTS

26.2.1 Excess liquid from the WCT shall be treated and disposed of according to Local Authority requirements.

26.2.2 The composted end product shall be disposed of according to the above requirements and any additional Local Authority requirements.

The Manager
Environmental Health
Environmental Health Unit
NSW Department of Health
PO Box 798
Gladesville NSW 2111

APPLICATION FOR APPROVAL OF A WATERLESS COMPOSTING TOILET

I / We (person) _____ (Title) _____

of _____ (Registered Business Name)

of _____ (Registered Business Address)

hereby make application for approval by the Director-General of the Department of Health, NSW, under the provisions of the Local Government (Approvals) Regulation, 1993, for a Waterless Composting Toilet to be known as:

(Registered Trade Name)

which is designed to serve _____ (persons).

Attached in support of this application is:

1. An evaluation report detailing the testing methods used and performance against the test criteria completed by the testing agency.
2. Documentation showing the third party quality management system certification body accredited by the Joint Accreditation System of Australia and New Zealand (JAS - ANZ) or equivalent.
3. Documentation that the laboratories used are National Association of Testing Authorities (NATA) registered.
4. A statement of the warranty and service life.
5. Product certification to a quality assurance system.
6. A copy of the installation and home owners operating manual.
7. A copy of the recommended service report sheet

8. A copy of the servicing manual
9. Three copies of full engineering drawings to scale on A3 paper, dimensioned and accompanied by a full listing of all components with name, model, size, description, function, material of manufacture and location in the waterless composting toilet.
10. Twenty copies of a printed plan of the waterless composting toilet on A4 size paper suitable for use with the submission of domestic on-site waste management applications under Section 68, Local Government Act, 1993, and Local Government (Approvals) Regulation 1993.

Signature:

Date:

Appendix B

SUGGESTED CONDITIONS OF APPROVAL

The following are conditions commonly used when recommending approval for any waterless composting toilet installation, and should be used as a guide only by the Local Authority. The Local Authority should also list any other conditions of approval which may be relevant.

- C The WCT shall be installed and operated in accordance with the manufacturer's instructions and any conditions imposed by this approval.
- C The maximum number of residents in the premises where the WCT is installed must not exceed _____ persons. The maximum number of residents does not include temporary visitors.
- C The manufacturer shall supply with each WCT a comprehensive manual with details of the maintenance procedures necessary to ensure the efficient and safe operation of the unit.
- C A permanent notice with basic instructions shall be affixed to the unit in a prominent position. The permanent notice shall include provision for recording the date of last deposit into each chamber and the last time the composted end product was removed.
- C That bulking material be added through the toilet chute in such amounts and frequency as specified in the manufacturers maintenance manual, taking into account the anticipated loading of the WCT.
- C The minimum composting period for the WCT shall be ...*(as specified on the NSW Health Department approval)*. A statement to that effect must be included on any accompanying literature.
- C The composted end product is only to be removed by the occupier for disposal from the WCT after the minimum composting period as stated.
- C Composted end product which is only partially composted may only be removed from the WCT with the written consent of the Local Authority. The Local Authority may issue instructions as to who may remove the composted end product and the method of disposal.
- C Unless otherwise directed by either the Local Authority or the NSW Health Department, the composted end product is to be disposed of by burial within the confines of the premises in soil which is not intended to be used for the cultivation of vegetables for human consumption or for grazing of animals. The minimum cover of soil over the deposited humus must be 100 mm.
- C Composted end material may only be removed from the closet through the access door provided for that purpose or from the compost storage tray.
- C The fan fitted to the air vent must be installed in such a manner that it operates continuously. Easy access must be provided for repairs or replacement of the fan.
- C WCTs should not be located within such distance from neighbouring dwellings so as to cause a nuisance due to odour or visual amenity.

- C The composted end product may not be removed from the premises unless the written approval of the Local Authority has been obtained.
- C All greywater must be disposed of in a manner so as not to create any nuisance or pollute any water course.
- C The site has been inspected and Council considers the composted end product and greywater can be completely disposed of without nuisance or likely danger to health.
- C Non-compliance with the above requirements may result in the creation of a nuisance necessitating remedial action being required by the Local Authority.

Appendix C

MINIMUM CRITERIA FOR ONGOING PERFORMANCE MONITORING

The minimum criteria that should be addressed during inspections for performance monitoring include the following;

- C Age of system
- C Type of use
- C Name brand (if WCT is manufactured)
- C Nuisance such as flies, odours or other user complaints
- C Moisture imbalance, such as too wet or too dry.
- C Mechanical malfunctions, such as rakes, fans etc.
- C Electrical malfunctions (other than a pump switch).
- C Material fatigue or failure, as related to construction, design, durability or corrosion, or improper installation (temperature control, insulation).
- C Neglect or improper use, inadequate maintenance, deposition of non-decomposable materials.
- C When problems are identified a brief narrative describing the problem and indicating the frequency (frequent, episodic or rare) and duration of the problem.

A form for gathering such information should be developed by the Local Authority.
