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| **Title** | **Develop a composting recipe for a composting facility** | | |
| **Level** | **5** | **Credits** | **20** |

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| **Purpose** | People credited with this unit standard are able to: identify and characterise raw materials for a composting recipe; establish production objectives for a composting recipe; develop compost recipe; and validate composting recipe, for a composting facility. |

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| **Classification** | Resource Recovery > Composting |

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| **Available grade** | Achieved |



**Guidance Information**

1 All work practices must comply with the: Health and Safety at Work Act 2015; Resource Management Act (RMA) 1991; Hazardous Substances and New Organisms Act 1996; NZS 4454:2005 Composts, soil conditioners and mulches; The New Zealand Waste Strategy: Reducing Harm, Improving Efficiency 2010 Ministry for the Environment, available at http://www.mfe.govt.nz; and HSNO Codes of Practice for Hazardous Substances, available at https://worksafe.govt.nz/.

2 Personal protective equipment (PPE) must be used throughout operations in accordance with company procedures. PPE includes but is not limited to – gloves, eye protection, appropriate footwear, overalls, hearing protection, respirator or facemask, high visibility clothing, fire extinguisher, first aid kit, eye wash kit, face shield/mask; hard hat.

3 Assessment against this unit standard requires evidence of developing three compost recipes.

4 Definitions
*A composting recipe* is a mixture of materials that results in characteristics suitable for rapid and reliable biological transformation whilst minimising potential for negative environmental emissions.
*Company procedures* mean the documented methods for performing work activities and include health and safety, environmental, and quality management requirements. They may refer to manuals, codes of practice, or policy statements.
*Feedstock* is organic materials used for composting or related biological treatment systems.
*Organic* in this industry refers to materials that are putrescible or are of animal or vegetable origin.
*Product performance data* refers to historical data on the performance of products in terms of their purpose.

*Raw materials* (compostable organic materials) may include but are not limited to – plant materials, food waste, wood and timber, sawdust, wood shavings, crop residuals, forestry residuals, manures, biosolids, sewage grit and screenings, fats and oils, organic sludges, paper-based materials, paper mill wastes.

## Outcomes and performance criteria

### Outcome 1

Identify raw materials for a composting recipe at a composting facility.

**Performance criteria**

1.1 Raw materials available for a composting recipe are visually identified in accordance with established company criteria.

1.2 Identified raw materials are classified from records and laboratory results in accordance with company procedures.

Range classes of raw materials may include but are not limited to – food, garden, grass, sludge, sawdust, manure, poultry by products; sludges and industrial waste indicating composition of chemicals; the waste may be wet and sloppy.

### Outcome 2

Establish production objectives for the composting recipe for at a composting facility.

**Performance criteria**

2.1 Product specifications are established using product performance data and company records in accordance with given market requirements and priorities.

2.2 A composting recipe that can potentially meet customer requirements is identified in accordance with company procedures.

### Outcome 3

Develop a composting recipe for a composting facility.

**Performance criteria**

3.1 Raw material classifications are entered into compost recipe calculator in accordance with company procedures.

3.2 Raw material proportions suitable for composting are calculated in relation to a particular site and method and are specified by weight in the resulting compost recipe.

Range may include but is not limited to – carbon to nitrogen ratio, moisture content, structure and porosity, pH.

3.3 Raw materials and compost production plan of the recipe are determined in accordance with company procedures.

Range compost production plan may include but is not limited to – compost recipe, handling and pre-processing for raw materials, additional water required, maximum size of compost pile, monitoring schedule, processing duration, post curing value adding required, final product specifications.

3.4 Composting batch management procedures are reviewed and variations to standard management procedure are defined and documented as a new procedure.

3.5 Compost production schedule of the recipe is estimated and documented in accordance with company procedures.

3.6 Compatibility of resulting composting recipe and production schedule is confirmed against documented customer requirements and priorities.

3.7 Density of pre-processed raw materials is quantified, and weight based recipe is translated into volume-based recipe for production in accordance with company procedures.

3.8 Volumetric composting recipe and production procedures are recorded as an operational batch or bucket recipe and procedure in accordance with company procedures.

**Outcome 4**

Validate composting recipe for a composting facility.

**Performance criteria**

4.1 Raw materials are prepared and mixed in accordance with the new composting recipe to form feedstock for composting.

4.2 Composting batch is managed in accordance with revised company procedure.

4.3 Composting pile is monitored to assess the efficiency of the composting process in relation to estimated production schedule and company procedures.

4.4 Impacts on the environment are monitored for compliance with company procedures and consents under the RMA.

Range impacts may evolve from but are not limited to – spills, leaks, anthropogenic greenhouse gas emissions, odours, organic dusts, litter, water pollution from runoff or leachate, attraction of pests, erosion, noise, fire.

4.5 Health and safety are monitored for compliance with facility plan and consents under the RMA.

4.6 Faults or variations in production observed at any stage of the process are identified and reported to designated personnel in accordance with company procedures.

4.7 Remedial action is carried out to maintain effective and consistent compost production in accordance with company procedures.

Range remedial action may include but is not limited to adjustments to processing technique, compost batch management.

4.8 Sampling and testing are conducted to determine completion of production process in accordance with NZS 4454 and company procedures.

4.9 End product quality is evaluated against established product specifications.

4.10 Compost recipe, production schedule, and procedures are revised to improve process efficiency and reliability, and product compliance with defined specifications.

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**This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.**

**Status information and last date for assessment for superseded versions**

| Process | Version | Date | Last Date for Assessment |
|---|---|---|---|
| Registration | 1 | 23 April 2007 | 31 December 2025 |
| Rollover and Revision | 2 | 28 March 2019 | 31 December 2025 |
| Review | 3 | 27 March 2025 | 31 December 2025 |

| Consent and Moderation Requirements (CMR) reference | 0014 |
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This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.