AUSTRALIA & NEW ZEALAND BIOSOLIDS PARNTERSHIP (ANZBP) – 2015

TECHNICAL SURVEY

PREPARED FOR POLLUTION SOLUTIONS AND DESIGNS

March 2020

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REVISION SCHEDULE

Rev No.	Date	Description	Signature or Typed Name (documentation on file)			
			Prepared by	Checked by	Reviewed by	Approved by
0	07/10/15	Final	Daniel Gulliver	Garrett Hall	Garrett Hall	
1	18/03/20	Update	M Tan			
Original Report issued October 2015 by MWH (now Stantec)						

Pollution Solutions and Designs

Technical Survey

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1. Introduction

The Australian and New Zealand Biosolids Partnership commissioned this national survey to identify the main features of biosolids management.

Biosolids are defined by the 2003 NZWWA "Guidelines for the Safe Application of Biosolids to Land in New Zealand" as sewage sludges (or mixtures) that have been treated and/or stabilised to the extent that they are able to be safely and beneficially applied to land.

This survey catalogues the following primary parameters:

- Biosolids production
- Biosolids end use
- Biosolids stabilisation grade
- Biosolids primary stabilisation process
- Biosolids dewatering process

The results of this survey are presented on a national basis.

March 2020 update: Pie charts in this report were updated to include the mass basis in addition to the number of WWTP with a technology, process or classification.

2. Method

The approach used to determine the biosolids production in New Zealand was to survey plants serving populations of over 25,000 people or 5,000 m^3/day (5 ML/day). This criteria captures approximately 70% of New Zealand's population.

All classifications are made on the basis of tonnes of production.

3. Classifications

To enable relatively simple analysis and presentation of the data each area of information, such as end use, was classified into a number of broad groupings. These groupings are discussed below.

3.1 Production

Production is presented in terms of tonnes of dry biosolids.

3.2 End Use

The following classifications were used for end use:

- Agriculture – for biosolids applied to land for its fertiliser value without value added processing.
- Composting – for biosolids processed through a composting facility and used for landscaping or other horticultural use.
- Forestry – for biosolids applied to plantation forests to aid tree growth
- Landfill – for biosolids disposed to landfill, including monofill
- Ocean Discharge – for WWTP where solids are disposed of to the ocean. These solids are not defined as biosolids and no biosolids mass is associated with these WWTP.
- Stockpile – for biosolids stored, pending future planning, processing or use.

- Land Rehabilitation – for biosolids used in the rehabilitation of land including mine rehabilitation
- Unspecified

3.3 Stabilisation Grade

Stabilisation grade was classified on the basis of and A, B, or C grading. This grading was adopted in light of the broad variation in nomenclature for stabilisation across Australia and New Zealand. The equivalent gradings are shown in the Table 3-1. WWTP that do not produce biosolids (such as those with Ocean Discharge) are not included.

Table 3-1: Stabilisation Gradings

Classification	NZ
A	A
B	B
C	Unstabilised

3.4 Stabilisation Process

Classification of the stabilisation process was made on a basis of the primary stabilisation process following the sewage treatment process. The following stabilisation categories were used:

- Anaerobic Digestion (including mesophilic digestion)
- Thermophilic Digestion
- Incineration
- Lagoon (used for biosolids storage in liquid form)
- Thermal Drying
- Composting (including vermicasting)
- Long term storage (of dewatered biosolids)
- Lime stabilisation
- Agitated air drying
- None

WWTP that do not produce biosolids (such as those with Ocean Discharge) are not included.

3.5 Dewatering Process

Classification of the dewatering process was made on the basis of the following categories:

- Belt Press
- Centrifuge
- Drying beds or lagoon
- None

WWTP that do not produce biosolids (such as those with Ocean Discharge) are not included.

4. Results

4.1 Production

The total biosolids production of New Zealand identified in the survey is approximately 77,000 tonnes per year of dry solids, which is an increase on the 74,000 tonnes produced in 2013. The solids content of the dewatered biosolid ranges from 2% to 96%, with an average of 30%. Approximately 440,000 tonnes of dewatered biosolid is produced per year, which is comparable to the 310,000 tonnes produced in 2013.

4.2 End Use

The end use of biosolids in New Zealand is presented below:

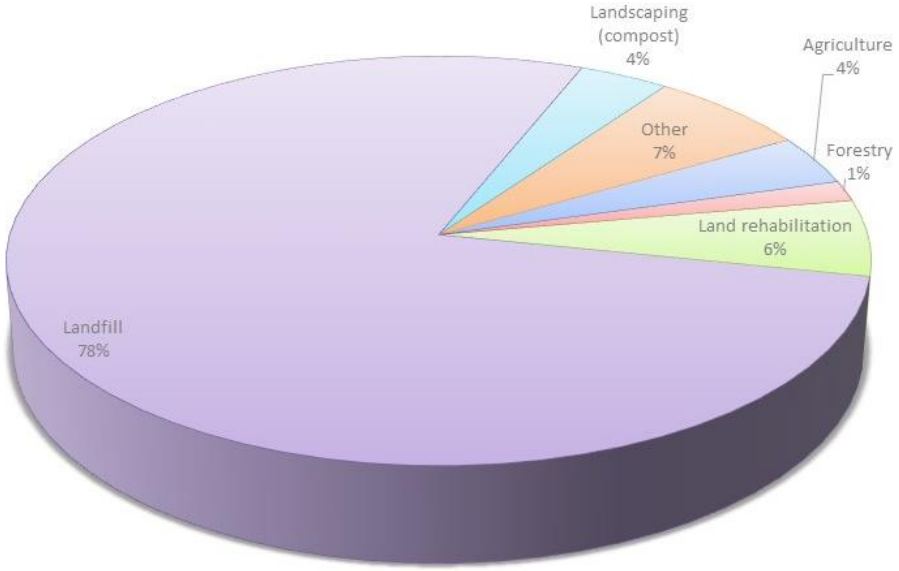

Figure 4-1 Biosolids end use (Mass Basis)

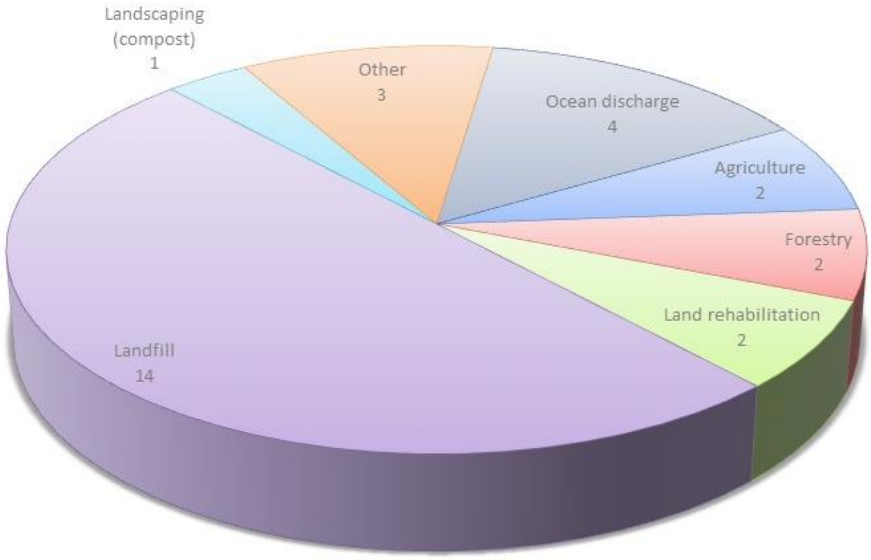

Figure 4-2 Biosolids end use (Number of WWTP Basis)

New WWTP surveyed in the 2015 maintained a similar split between landfill and non-landfill usages to that in the 2013 survey. This is despite the relative proportion of landfill as an end destination reducing based on the number of WWTP. These new sites include the Greymouth and Gisborne WWTP which have ocean discharges.

4.3 Stabilisation Grade

The stabilisation grade of biosolids in New Zealand is presented below:

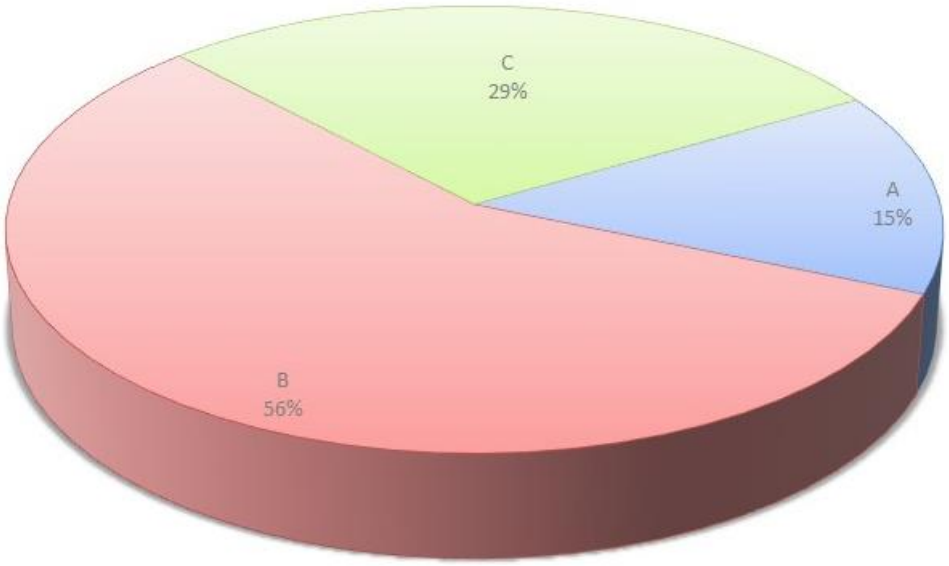

Figure 4-3 Biosolids Stabilisation Grade (Mass Basis)

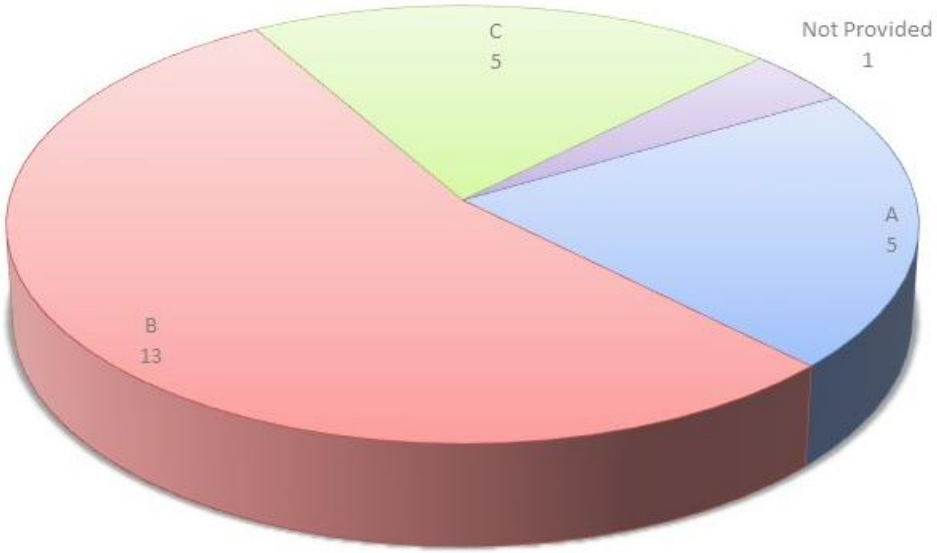

Figure 4-4 Biosolids Stabilisation Grade (Number of WWTP Basis)

The stabilisation grade of biosolids in New Zealand has remained similar from the 2013 survey. There has been increases in the number of plants surveyed in both Grade B and No Grade categories.

4.4 Stabilisation Process

The stabilisation process used for biosolids in New Zealand is presented below:

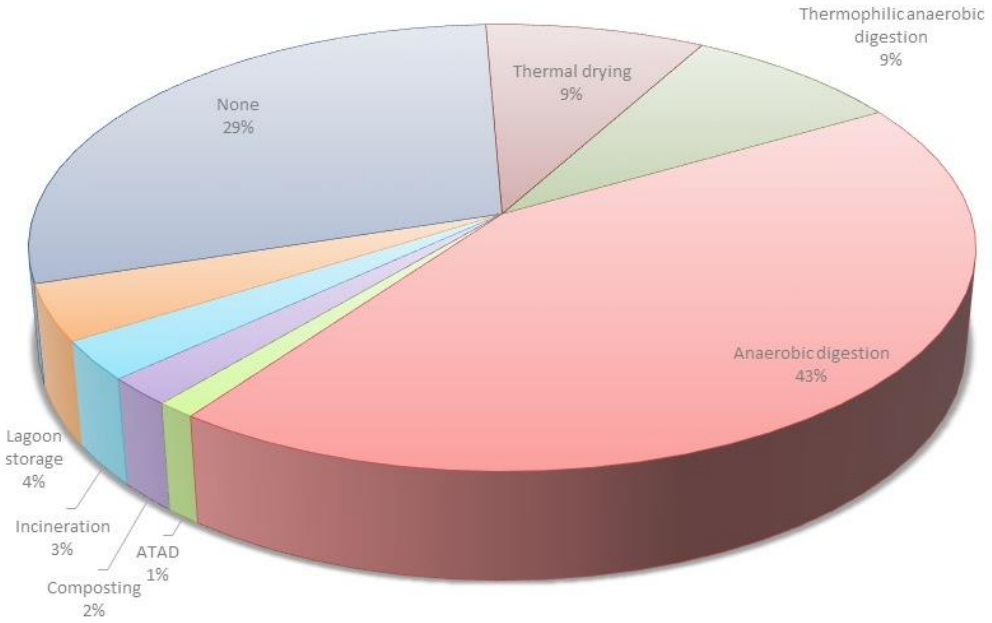

Figure 4-5 Biosolids Stabilisation Process (Mass Basis)

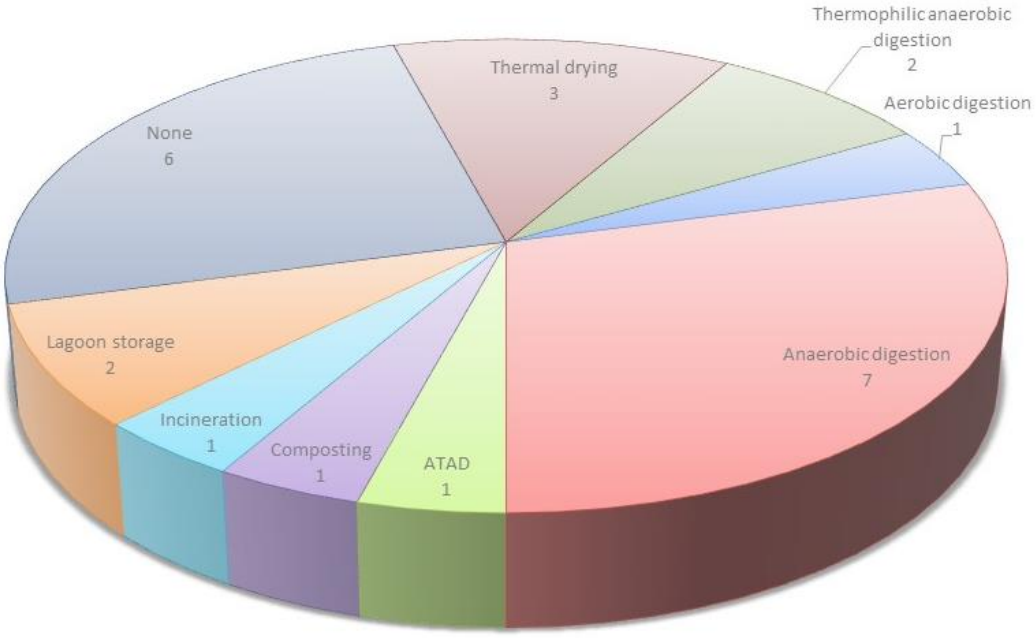

Figure 4-6 Biosolids Stabilisation Process (Number of WWTP Basis)

Notable changes in distribution between the 2015 and 2013 surveys are:

- Bells Island WWTP classified as ATAD (Autothermal Thermophilic Aerobic Digestion) from its previous thermophilic anaerobic digestion.
- New addition of Seaview WWTP with thermal drying for stabilisation increasing that category to 9% from 4%.
- A large increase in the number of WWTP surveyed with no stabilisation process (to 10 from 5)

4.5 Dewatering Process

The dewatering process used for biosolids in New Zealand is presented below:

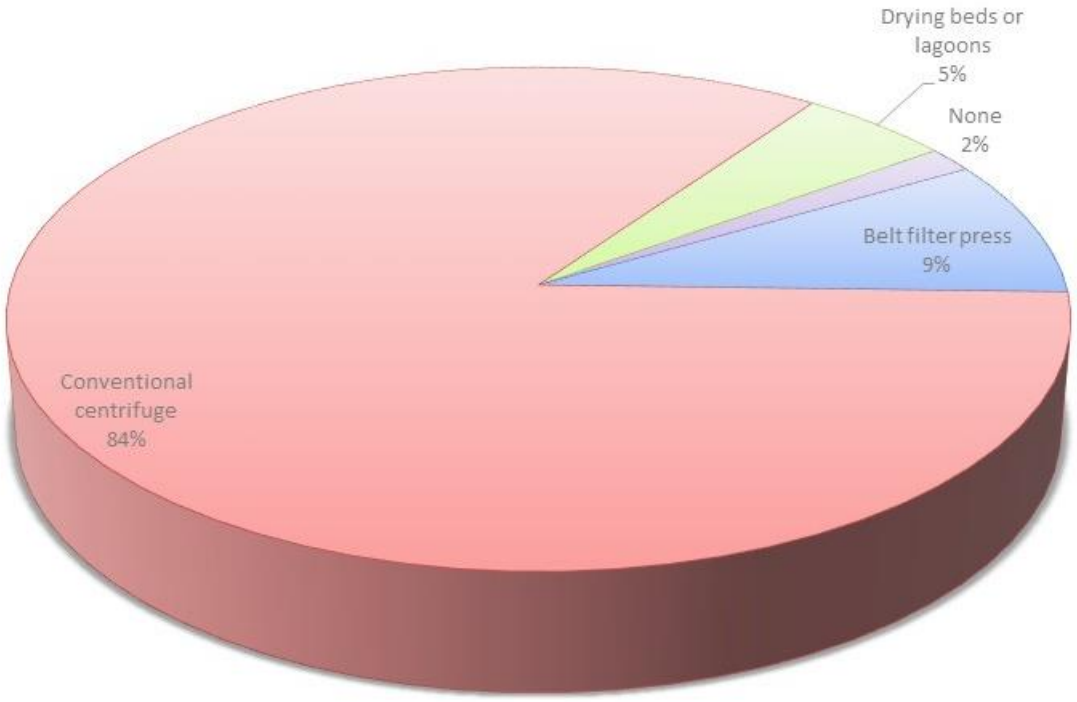

Figure 4-7 Biosolids Dewatering Processes (Mass Basis)

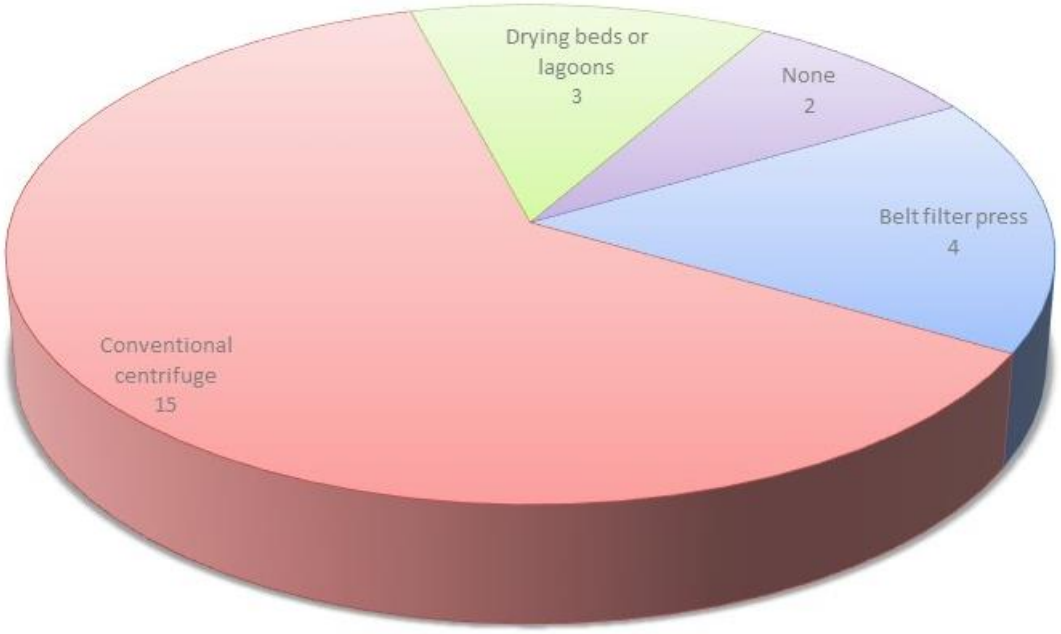

Figure 4-8 Biosolids Dewatering Processes (Number of WWTP)

Dewatering processes had little change from the 2013 survey on both the mass percentage and number of WWTP surveyed.

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