Australian & New Zealand Biosolids Partnership Survey 2025 - New Zealand Results

Stantec

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C	11/03/26	Update following Client review	A. Slaney	J. Bradley	J. Mayes	R. Searle

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Executive Summary

The New Zealand results from the 2025 Australian and New Zealand Biosolids Partnership (ANZBP) biosolids survey are largely consistent with those from the last survey in 2023. Some main points emerging from this survey are:

- Total biosolids production increased slightly (7%) while per capita production remained stable compared with previous results.
- The Mangere WWTP alone accounts for 43% of the total surveyed biosolids production on a dry solids basis. The Mangere WWTP sends it biosolids to a nearby quarry.
- Excluding the Mangere WWTP, landfilling of biosolids remains the largest end use on both a dry solids production and plant count basis.
- The proportion of biosolids turned into compost for landscaping has increased from 7% to 12 % of total dry solids production since the 2023 survey.
- 56% of biosolids achieved Grade B stabilisation and 9% achieved Grade A stabilisation reflecting the use of anaerobic digestion in large New Zealand cities, and to a lesser extent thermal drying and vermicomposting.
- The recently released 2025 New Zealand biosolids guidelines have yet to be widely adopted by the industry which is to be expected given the limited time since they have been finalised. The May 2025 revision was issued before the survey, however the survey responses do not capture the Final revision which was issued in December 2025.
- As in previous surveys, emerging contaminants such as PFAS and microplastics, and tighter regulations, are key concerns in the industry, while new processing technologies and moving from landfill to beneficial / high value uses are seen as the major future opportunities.

Acronyms / Abbreviations

Acronym / Abbreviation	Full Name
ANZBP	Australian & New Zealand Biosolids Partnership
ATAD	Autothermal thermophilic aerobic digestion
DS	Dry solids
g/p/d	Grams per person per day
GWh/y	Gigawatt hour per year
PFAS	Per-and polyfluoroalkyl substances
t/d ds	Tonnes per day dry solids
WWTP	Wastewater treatment plant

1 Introduction

The Australia and New Zealand Biosolids Partnership (ANZBP) have conducted a survey of biosolids production at wastewater treatment WWTPs (WWTP) across both countries biennially since 2010. These surveys are conducted biennially and aim to form an accurate and comprehensive dataset of biosolids production and end use. The parameters surveyed are:

- Biosolids production
- Biosolids end use
- Biosolids stabilisation grade
- Biosolids contamination grade
- Biosolids main stabilisation process
- Biosolids further stabilisation process
- Biosolids dewatering process
- Transportation of biosolids to end use
- Stockpile data
- Emerging contaminant measurement
- Emerging contaminant risk management
- Production of renewable energy from biosolids
- End Use risk management
- Biosolids transactions
- Biosolids branding
- Opportunities and risks for the biosolids industry
- Additional questions (see Section 3.15)

2 Survey Method

A survey requesting the aforementioned information was sent to New Zealand local authorities operating WWTPs with a load of 25,000 PE or larger. Some smaller WWTPs were also surveyed, having been included in previous surveys, and where they responded the data was included.

Of the 36 WWTPs surveyed, 28 responses were received. For the WWTPs where no response was received a 2% increase in dry solids biosolids production was applied to the 2023 survey figure to account for population growth and allow the total biosolids production number to be compared with previous surveys.

Two of the WWTPs do not produce a separate biosolids stream because they use a biological trickling filter process with no clarifier and ocean discharge. These are not included in the survey counts.

3 Classifications

To enable simple analysis, presentation, and comparison between survey years the responses for each question are classified into broad groupings. These groupings are discussed below.

3.1 Production

The amount of biosolids produced is presented in tonnes per day dry solids (t/d ds). This enables direct comparison between years as it is independent on the level of dewatering undertaken.

3.2 End Use

The following categories were used to classify the end use of biosolids on a dry solids basis:

- Agriculture – for biosolids applied to land for its fertiliser value without value added processing
- Forestry – for biosolids applied to plantation forests to aid tree growth
- Landscaping – for biosolids used for landscaping or other horticultural use. Note this end use category changed in 2023 from “Landscaping (compost)”, as composting is classed as a stabilisation process not an end use.
- Landfill – for biosolids disposed to landfill, including monofill
- Stockpile – for biosolids stored, pending future planning, processing or use
- Land rehabilitation – for biosolids used in the rehabilitation of land including mine rehabilitation
- Landfill capping - biosolids used in the capping of landfills
- Other (Unspecified).

3.3 Stabilisation Grade

The stabilisation of biosolids refers to applying processes which reduce the presence of pathogens, odour generation, and vector attraction potential.

Under the old New Zealand biosolids guidelines (NZWWA, 2003) the level of stabilisation of biosolids was classified as ‘A’, ‘B’ or ‘unstabilised’. This classification has been maintained in the replacement guideline document finalised in December 2025, the Water NZ Guideline for Beneficial Use of Biosolids on Land (Water NZ, 2025). The New Zealand stabilisation grade terminology is used in this report.

3.4 Contamination Grade

Under the 2025 Biosolids Guidelines, biosolids contaminant grade is either ‘1’ (all contaminants are below their limits) or ‘2’ (one or more contaminants exceed the limit). The old biosolids guidelines had two sets of limits “a” and “b. The 2025 and 2003 guideline limits are shown in Table 3-1.

Table 3-1. New Zealand Biosolids Contaminant Grade Limits (all in mg/kg dry weight)

	2025 Biosolids Guidelines	**2003 Biosolids Guidelines**	
	Grade 1	Grade a	Grade b
Arsenic	30	20	30
Cadmium	6.5	1.0	10
Chromium	1,500	600	1,500
Copper	750	100	1,250
Lead	300	300	300
Mercury	7.50	1.0	7.50
Nickel	135	60	135
Zinc	1,250	300	1,500
PFAS	Refer to PFAS NEMP	n/a	n/a

As shown in Table 3-1 the new Grade 1 limits are very similar to the old Grade b limits. The removal of the old Grade 'a' contaminant standard reflects the fact the contaminant levels were difficult to achieve in practice due to metals concentrations in New Zealand domestic wastewater, in particular copper and zinc.

New Zealand municipal biosolids sector is still transitioning from the old guidelines to the new guidelines, both the old and the new contaminant grades are referred to in this report.

3.5 Stabilisation Process

The following stabilisation categories were used:

- Aerobic digestion
- Anaerobic digestion
- Autothermal thermophilic aerobic digestion (ATAD)
- Thermal drying
- Lagoon storage
- Long term storage (of dewatered biosolids)
- Lime stabilisation
- Composting
- Incineration
- Extended aeration
- Solar drying
- Sludge drying beds and drying lagoons
- Pyrolysis and gasification
- No further stabilisation

3.6 Dewatering Process

The following dewatering categories were used:

- Conventional centrifuge
- High solids centrifuge
- Belt filter press
- Drying beds or lagoons
- Screw press
- None

3.7 Stockpile Data

The following information was collected about biosolids stockpiles:

- Whether WWTPs are currently stockpiling biosolids
- The size of any historical stockpiles in dry tonnes
- The net change in the size of the stockpile in tonnes of dry solids during the past two years

3.8 Transportation to End Use

Classification of the transportation of biosolids to its end use was made based on the following distance ranges:

- No Transport
- 1-50 km
- 51-150 km
- 151-400km
- Over 400 km.

3.9 Emerging Contaminants

An identification of the risk management approach to emerging contaminants was made within the following categories:

- No risk management approach to emerging contaminants
- Monitoring only
- Screening level risk assessment
- Detailed risk assessment

Additionally, data was collected on whether WWTPs were testing biosolids for PFAS and/or other emerging contaminants or not.

3.10 Renewable Energy

Classification of whether and for what purposes renewable energy was produced from biosolids was made according to the following categories:

- No energy is produced from biosolids processing
- Biogas is used to provide heat for onsite use; no electricity is produced
- Biogas is used to provide heat for export; no electricity is produced
- Biogas is used to provide heat and electricity for onsite use
- Biogas is used to provide heat for onsite use and electricity is exported to the grid
- Biogas is exported offsite
- Other (pls specify in comments field)

If renewable energy was produced, WWTPs were requested to indicate the amount of electricity and/or useful heat in GWh/year.

3.11 End Use Risk Management

Classification of local authorities' end-use risk management of biosolids was made based on the following categories:

- Managed in-house
- Managed by a 3rd party
- Managed by a 3rd party and audited in-house

It is noted that under the New Zealand Resource Management Act 1991 procedures are required in terms of classifying permitted and discretionary activities. For discretionary activities, such as biosolids discharge onto land, individual resource consents are required. These resource consents require a full environmental effects assessment, which includes a full assessment of risks and risk mitigation techniques.

3.12 Biosolids Transactions

The transactions involved in biosolids reuse, disposal including removal at each plant were classified into the following categories:

- Give biosolids away with costs covered by the recipient
- Receive payment for biosolids
- Pay for removal from site for end use/disposal
- Not applicable
- Other

3.13 Biosolids Branding

Respondents were asked to classify the commercialisation status and branding of their biosolids according to the following categories:

- Sold by utility/council with a brand name
- Sold by utility/council but unbranded
- Sold by a third party with a brand name
- Sold by a third party but unbranded
- Not applicable

3.14 Industry Risks and Opportunities

Respondents were asked to reflect on the main risks and opportunities to the biosolids industry. No classifications were predetermined for these questions. After reviewing the responses, key themes around both risk and opportunity were identified, and responses were classified as such.

3.15 Additional Questions in 2025

New Biosolids Guidelines for New Zealand

Finalised in December 2025, the Water NZ Guideline for Beneficial Use of Biosolids on Land replace the 2003 guidelines. These introduce a risk-based framework, updated stabilisation and contaminant grading, improved alignment with iwi Māori and community perspectives, and soil-ecology protection. The survey asks whether organisations have reviewed, are reviewing, or have already adopted the new guidelines, how the framework aligns with current practice, and which mechanisms (consent conditions, procurement specifications, etc.) are most practical for implementation.

National Wastewater Environmental Performance Standards

Taumata Arowai has consulted on proposed national wastewater environmental performance standards covering discharge to water, discharge to land, beneficial use of biosolids, and network overflows and treatment plant bypasses. The survey asks about expectations of likely changes in quality or quantity of biosolids when new resource consents are granted based on the wastewater environmental performance standards.

4 Survey Results

4.1 Total Production

Total biosolids production is presented in Table 4-1 and in Figure 4-1.

Table 4-1: Total Biosolids Production

Year	Total Biosolids Production (t/d ds)	Total Population Equivalent for Surveyed WWTPs	Per Capita Biosolids Production (g/p/d)
2010	159	Not surveyed	
2013	189	Not surveyed	
2015	211	Not surveyed	
2017	176	Not surveyed	
2019	174	Not surveyed	
2021	182	3,794,995	48
2023	205	4,212,386	49
2025	219	4,183,127	52

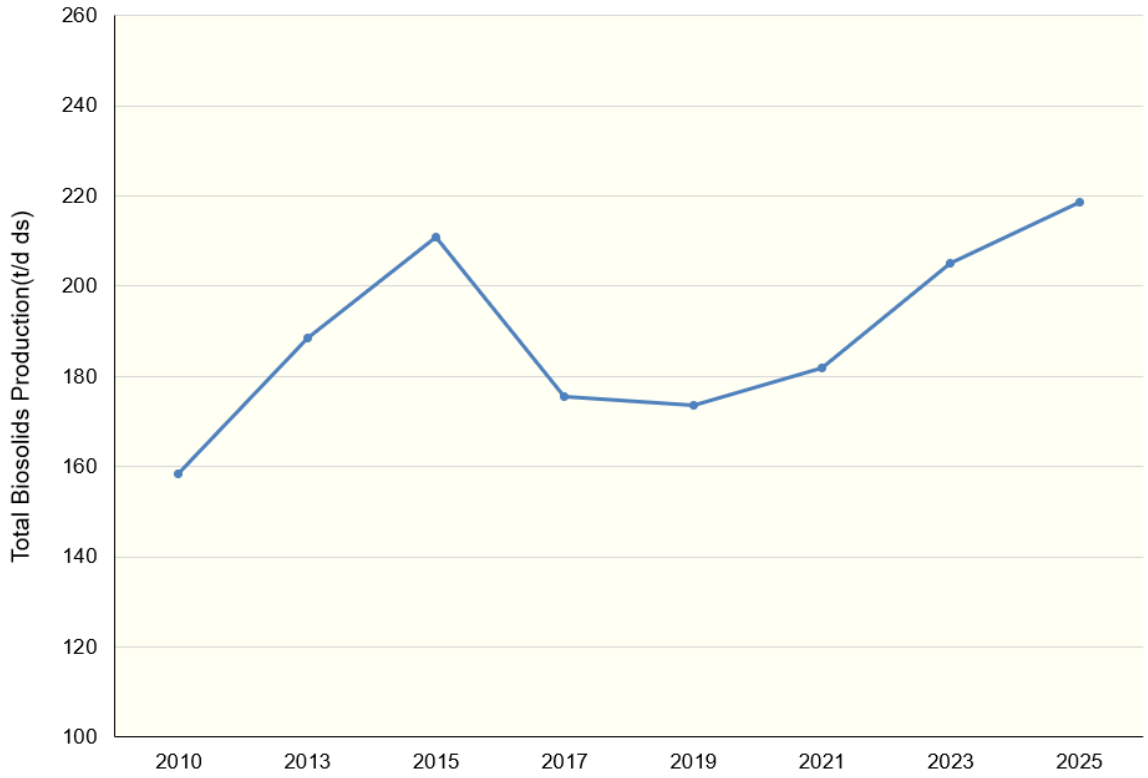

Figure 4-1: New Zealand Biosolids Survey Total Biosolids Production

Biosolids production by individual WWTP is shown in Figure 4-2.

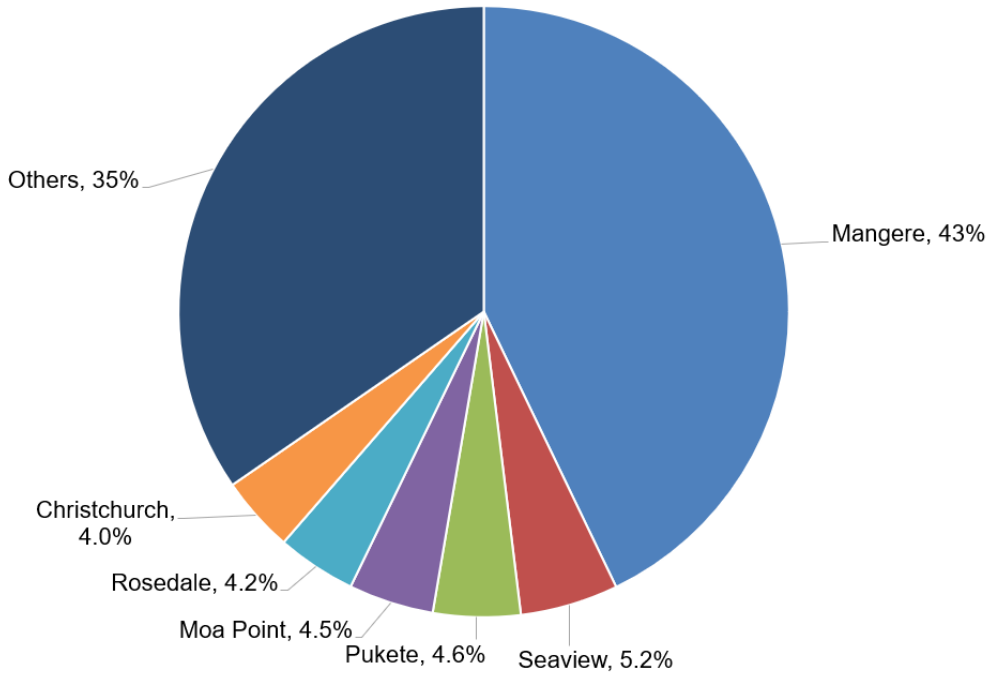

Figure 4-2: Proportion of Surveyed Biosolids Production by WWTP

The overall biosolids production has increased by around 7% relative to the 2023 survey figure, which is likely due to population growth. The total population covered by the survey represents around 80% of the population.

As shown in Figure 4-2, biosolids production in New Zealand is somewhat dominated by the Mangere WWTP which serves Auckland and accounts for 43% of the total dry solids production covered by this survey.

The other individual WWTPs shown in Figure 4-2 service the major New Zealand cities: Christchurch, Auckland's North Shore (Rosedale), Wellington / Hutt Valley (Moa Point and Seaview) and Hamilton (Pukete). In total these WWTPs make up 65% of the total biosolids production covered by the survey.

Due to the skewing of biosolids production numbers towards the one large plant (Mangere), figures in subsequent sections of this report are presented on both a solids production basis and a WWTP count basis where relevant, to provide a more balanced picture of practices throughout the country.

4.2 Biosolids End Use

Biosolids end uses by dry solids production and by plant count are presented in Figure 4-3 and Figure 4-4.

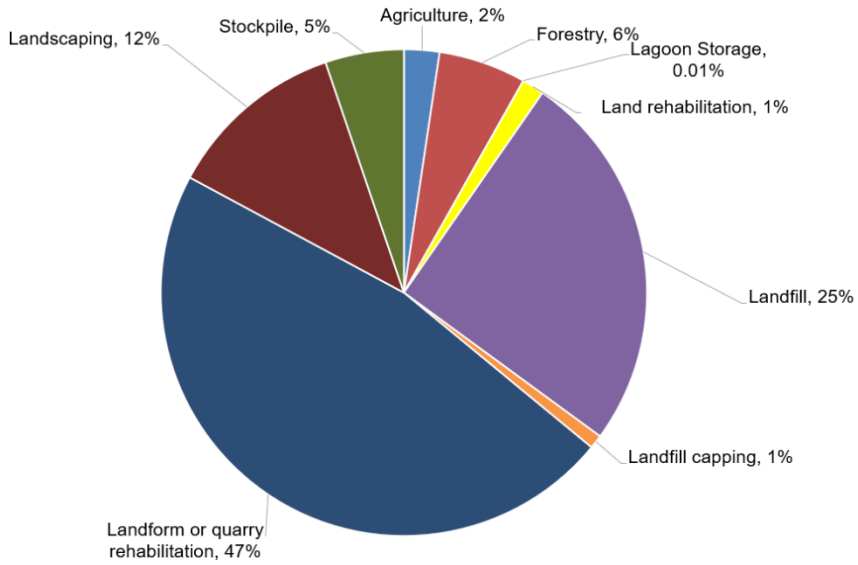

Figure 4-3: Biosolids End Use (Dry Solids Production Basis)

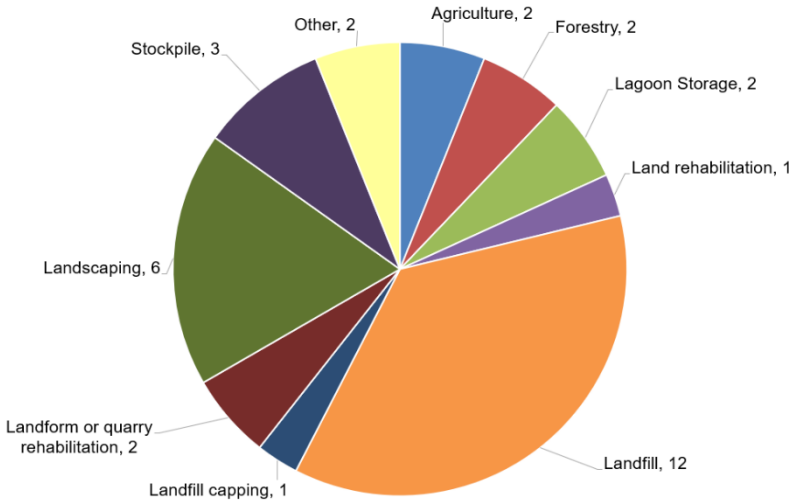

Figure 4-4: Biosolids End Use (Plant Count)

As noted in Section 3.1, the breakdown by solids production is skewed by the Mangere WWTP which sends its biosolids to quarry rehabilitation (Figure 4-3). Landfilling remains the most common end use for biosolids in New Zealand, accounting for around 36% of WWTPs surveyed and 23% of the total solids production, down from 30% in the 2023 survey. Landscaping has increased to 12% of dry solids production compared with 7% in 2023, a significant increase.

4.3 Stabilisation Grade

Biosolids stabilisation grade by dry solids production and plant count is presented in Figure 4-5 and Figure 4-6.

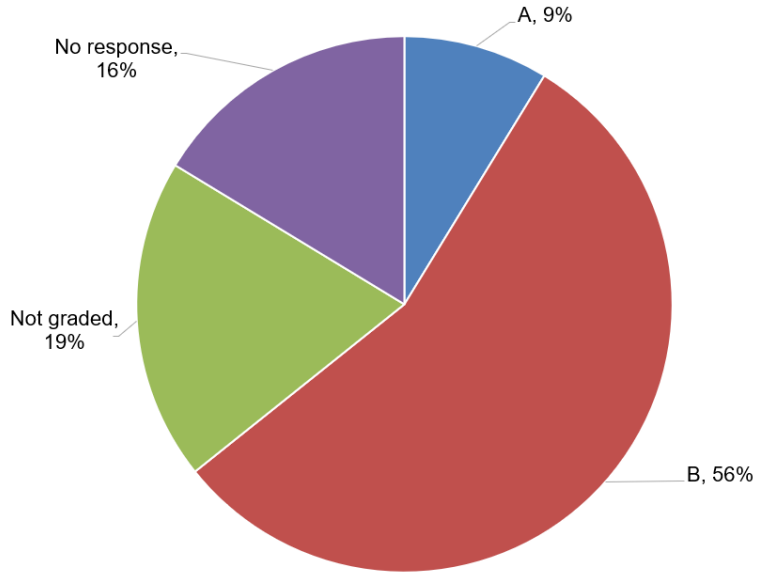

Figure 4-5: Biosolids Stabilisation Grade (Dry Solids Production Basis)

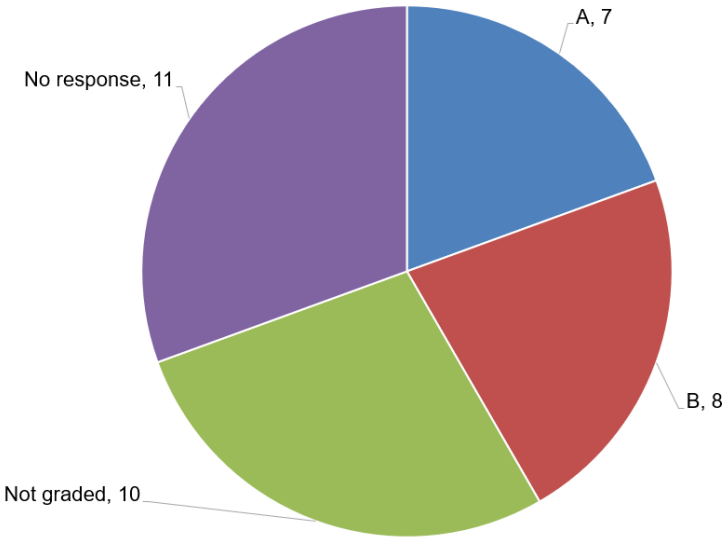

Figure 4-6: Biosolids Stabilisation Grade (Plant Count)

As with previous surveys, Grade B stabilisation is the most common grade by solids production, reflecting that large cities tend to stabilise their sludge through anaerobic digestion. Grade A is less common and requires thermal treatment. In New Zealand Grade A biosolids are produced through thermal drying, autothermal aerobic digestion or vermicomposting.

4.4 Contamination Grade

Biosolids contamination grade by dry solids production for the 2003 Guidelines and the 2025 Guidelines are presented in Figure 4-7 and Figure 4-8 respectively.

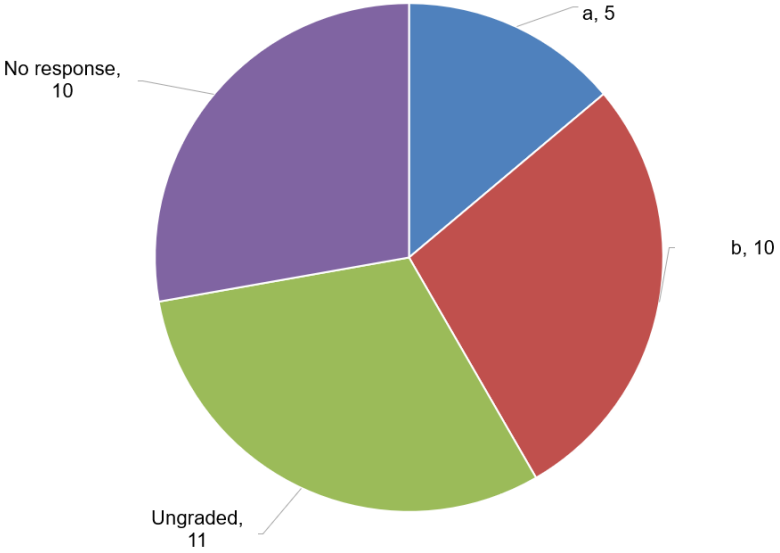

Figure 4-7: Biosolids 2003 Guidelines Contamination Grade (Plant Count Basis)

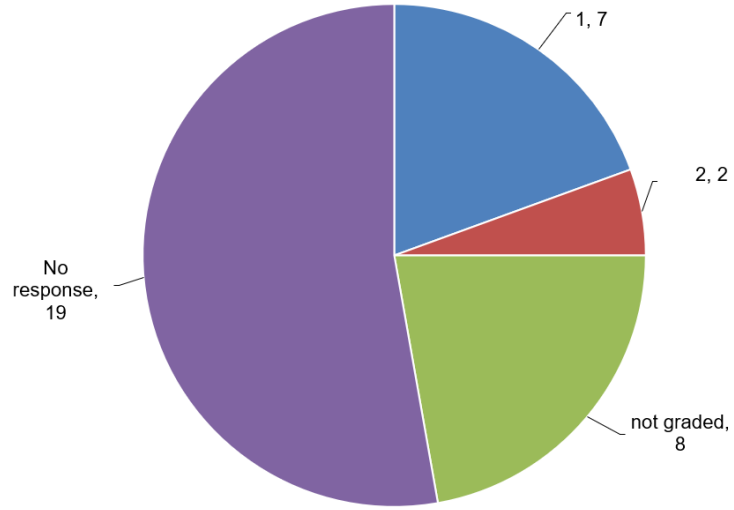

Figure 4-8: Biosolids 2025 Guidelines Contamination Grade (Plant Count Basis)

The Grade 1 classification under the new guidelines replaces both the old Grade a and Grade b classifications so over time the proportion of solids production meeting Grade 1 should increase as WWTPs adopt the new guidelines, and eventually reach the Grade a and b total of 15 (Figure 4-7).

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4.5 Stabilisation Process

Primary stabilisation process by dry solids production and plant count are presented in Figure 4-9 and Figure 4-10 respectively.

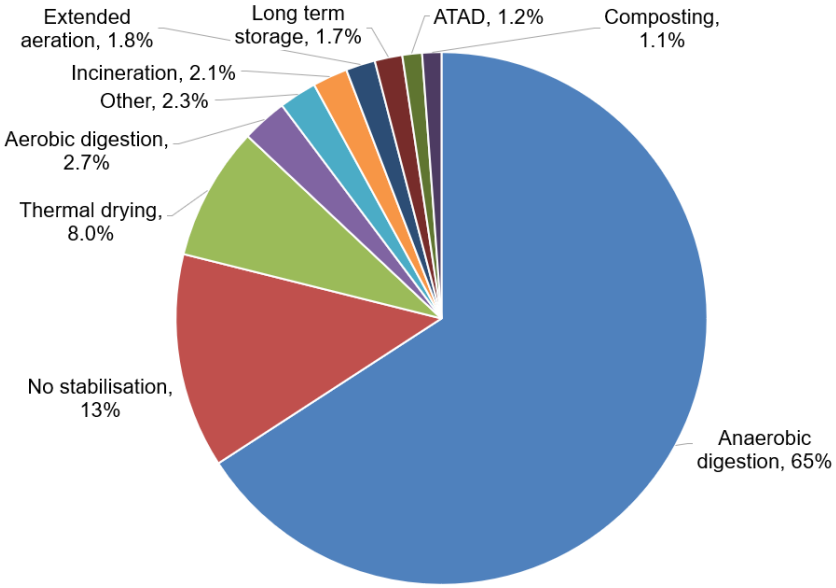

Figure 4-9: Primary Stabilisation Process (Dry Solids Production Basis)

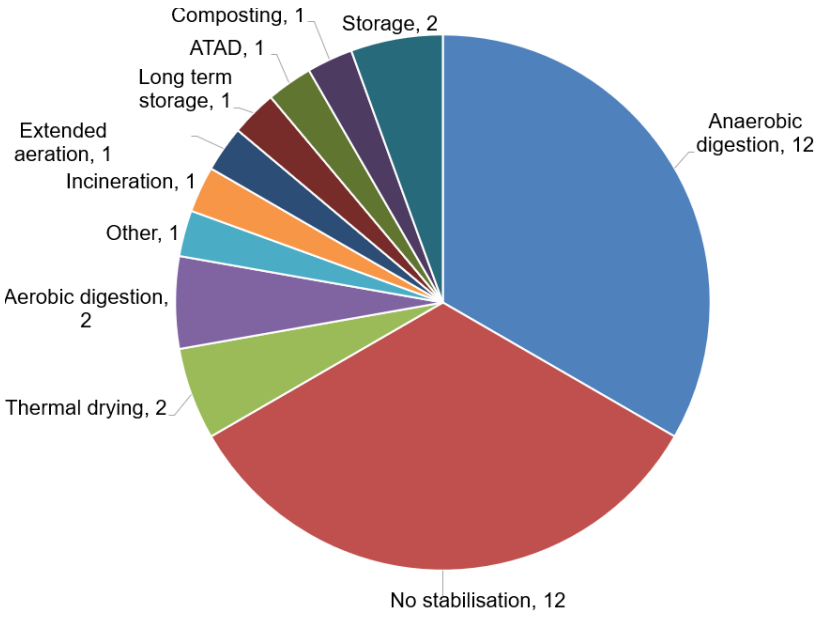

Figure 4-10: Primary Stabilisation Process (Plant Count)

The results are very similar to the 2023 results which is expected as there have been no significant upgrades to the large WWTPs in the intervening period. As noted previously, anaerobic digestion is the most common stabilisation method in New Zealand (this category includes mesophilic, thermophilic, acid and temperature phased digestion processes with mesophilic being the most commonly used).

4.6 Dewatering Process

Dewatering process by dry solids production and plant count are presented in Figure 4-11 and Figure 4-12 respectively.

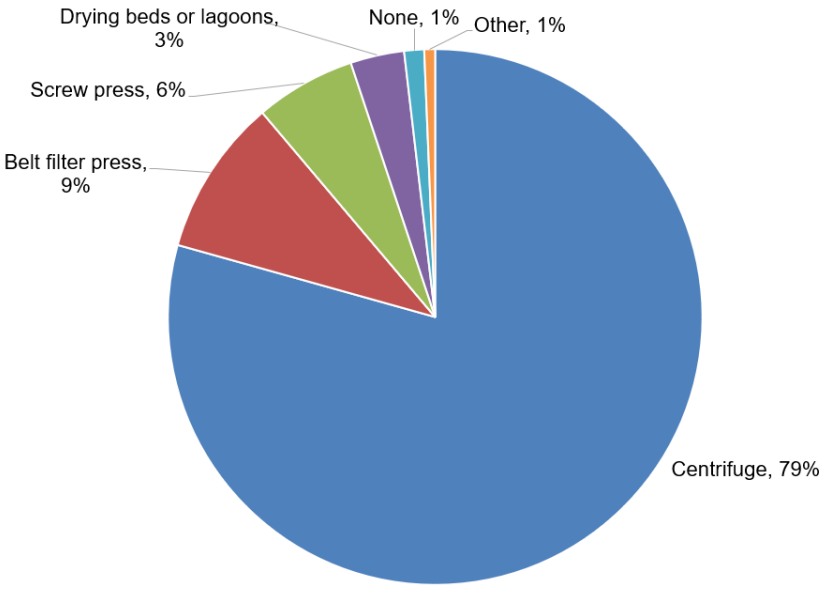

Figure 4-11: Dewatering Process (Dry Solids Production Basis)

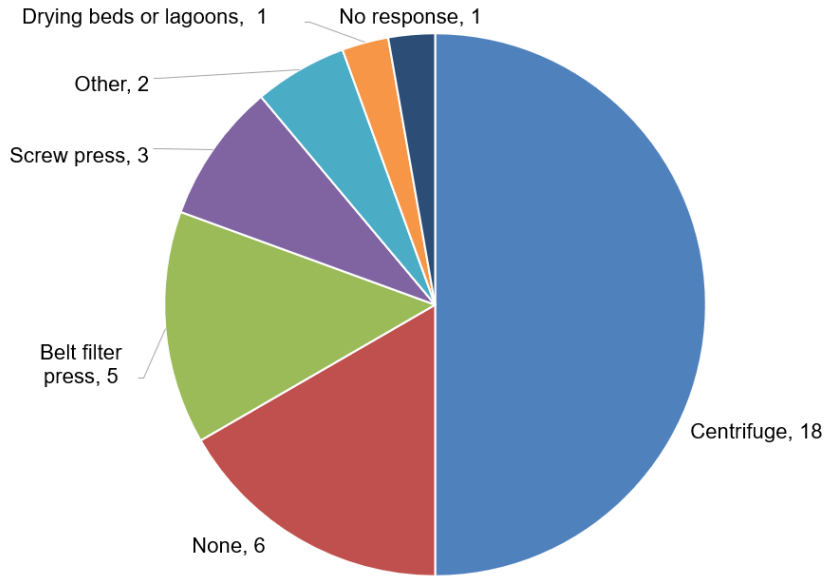

Figure 4-12: Dewatering Process (Plant Count)

The results are similar to the 2023 survey results with centrifuges being the most common dewatering technology followed by belt filter presses., Centrifuges are used at the larger WWTPs.

4.7 Stockpiles

Of the 36 WWTPs surveyed, 6 reported having historic stockpiles of biosolids but no WWTPs are currently stockpiling.

In New Zealand, stockpiling of biosolids is commonly undertaken in the base of oxidation ponds. The ponds are then desludged every 20 years or so with the dewatered sludge either stored on site or taken to landfill. Oxidation ponds are the most common treatment process in New Zealand however not for the larger towns and cities and are therefore not captured by this survey.

4.8 Transportation Distance

Biosolids transportation distances to end use location are presented in Figure 4-14.

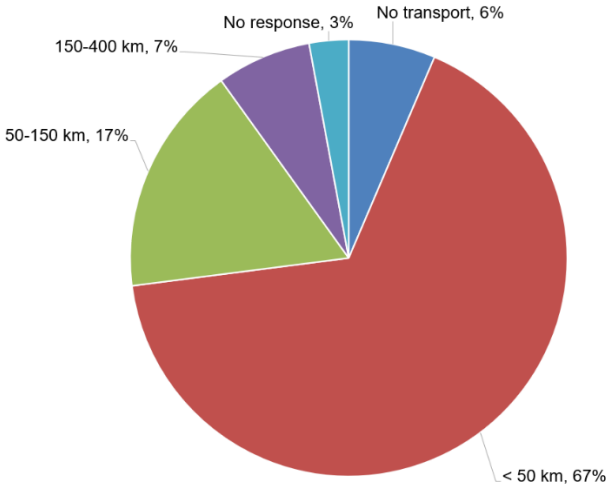

Figure 4-13: Biosolids Transport Distance (Dry Solids Production Basis)

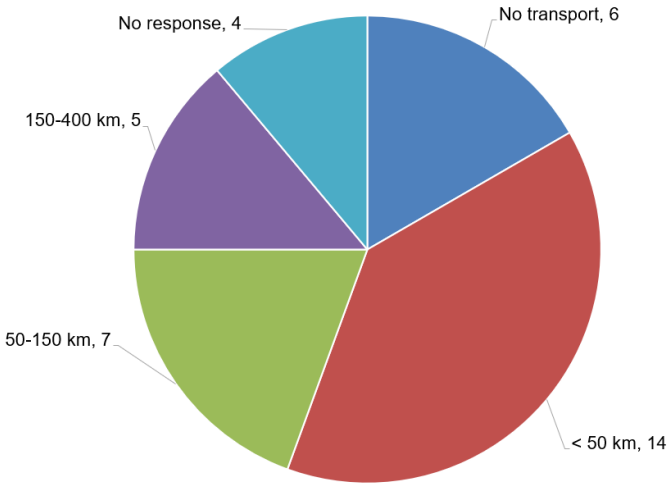

Figure 4-14: Biosolids Transport Distance (Plant Count)

The majority of WWTPs have either no transport or less than 50 km transport distance.

4.9 Emerging Contaminants

The current testing status of biosolids for PFAS, microplastics and personal care products, and risk management approaches to emerging contaminants, are presented in Figure 4-15 to Figure 4-18.

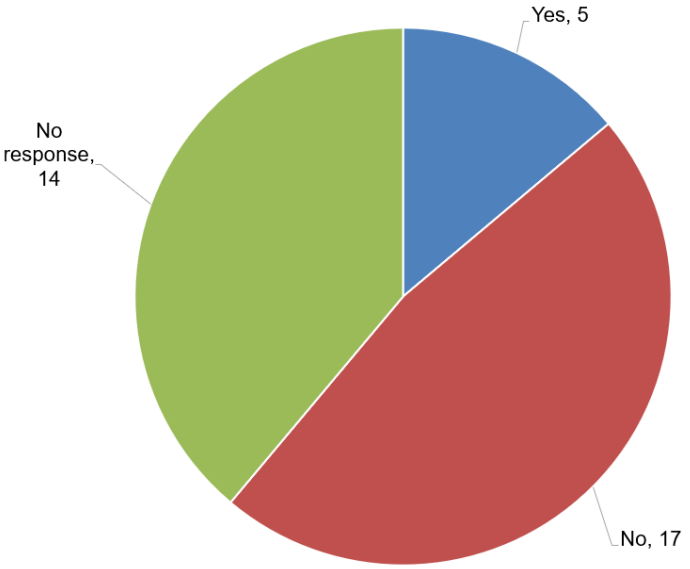

Figure 4-15: Testing for PFAS (Plant Count)

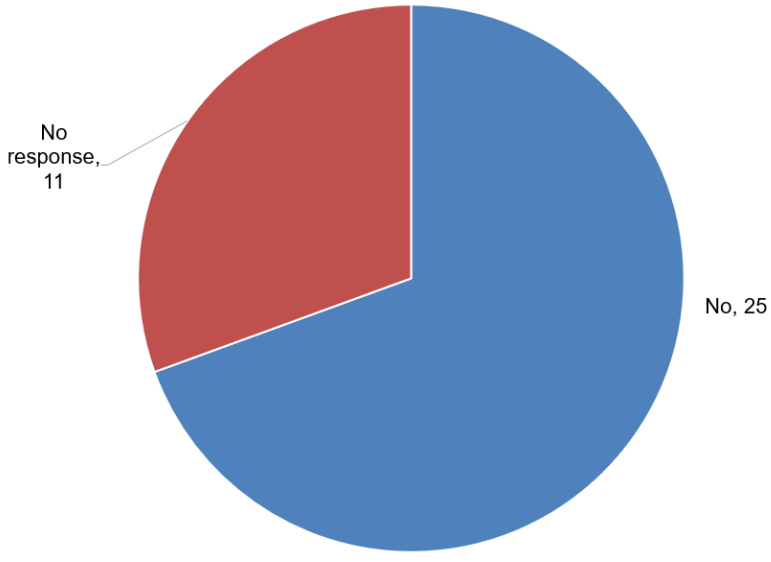

Figure 4-16: Testing for Microplastics (Plant Count)

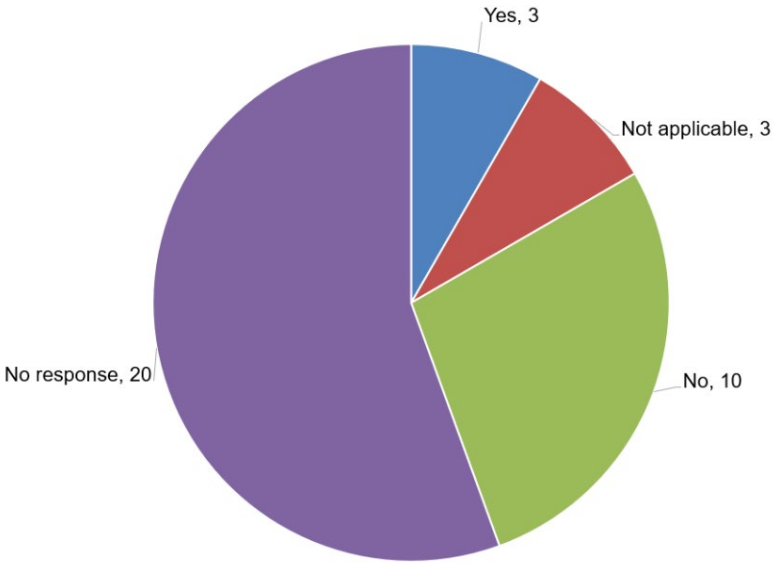

Figure 4-17: Testing for Personal Care Products (Plant Count)

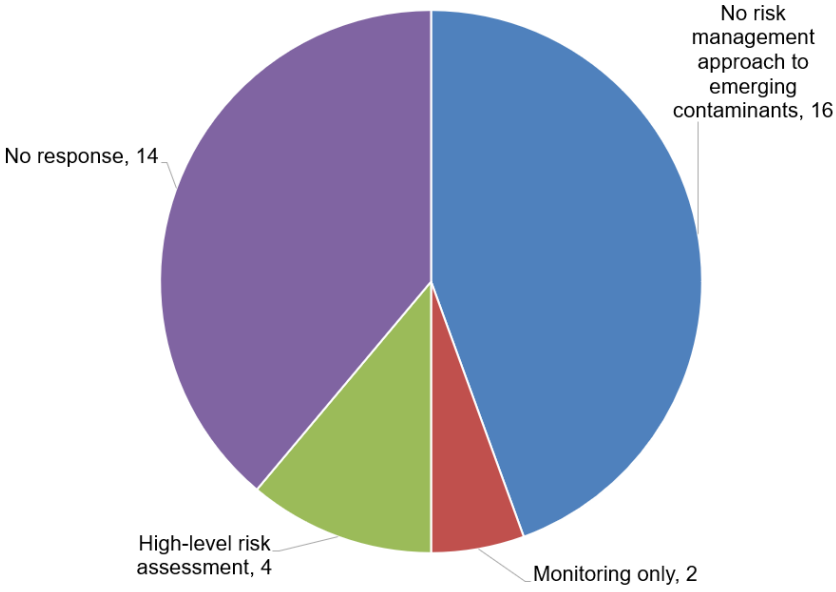

Figure 4-18: Emerging Contaminant Risk Management Approach (Plant Count)

The survey results show that testing for emerging contaminants in biosolids is relatively uncommon in New Zealand, as are associated risk assessments. This is unsurprising given the prevalence of landfill disposal of biosolids where emerging contaminants are generally of lower concern.

If beneficial use of biosolids increases in the future at the expense of landfill disposal then testing for emerging contaminants would be expected to increase also.

4.10 Energy Production

The proportion of biosolids used to produce energy (dry solids basis) is presented in Figure 4-19. The breakdown in energy use (dry solids basis) is presented in Figure 4-20.

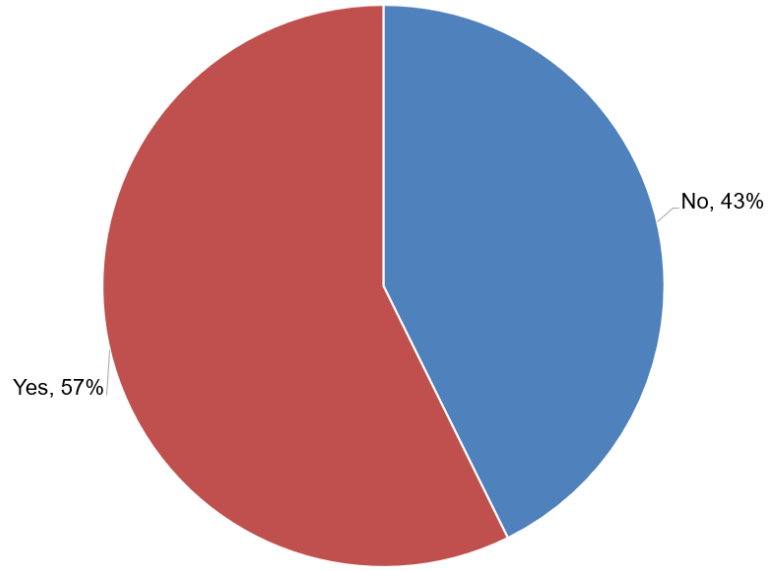

Figure 4-19: Energy Produced from Biosolids (Dry Solids Production Basis)

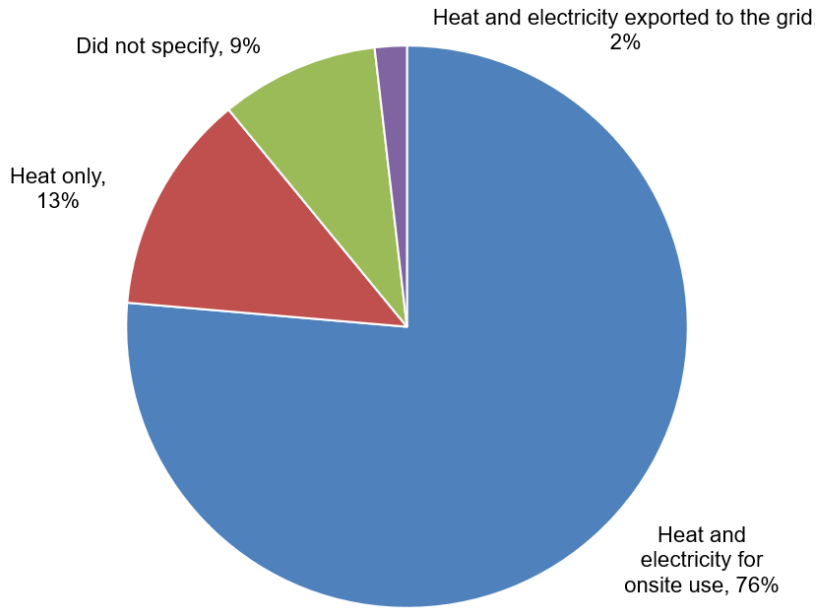

Figure 4-20: Energy Uses (Dry Solids Production Basis)

The result is similar to previous surveys and reflects the fact that sludge is anaerobically digested and used to generate biogas in the large New Zealand cities (Figure 4-9). Where biogas is generated, by far the most is used to generate heat and electricity. This is generally achieved using combined heat and power (CHP) gas engines.

4.11 End Use Risk Management

The risk management practices for biosolids end use are presented in Figure 4-21.

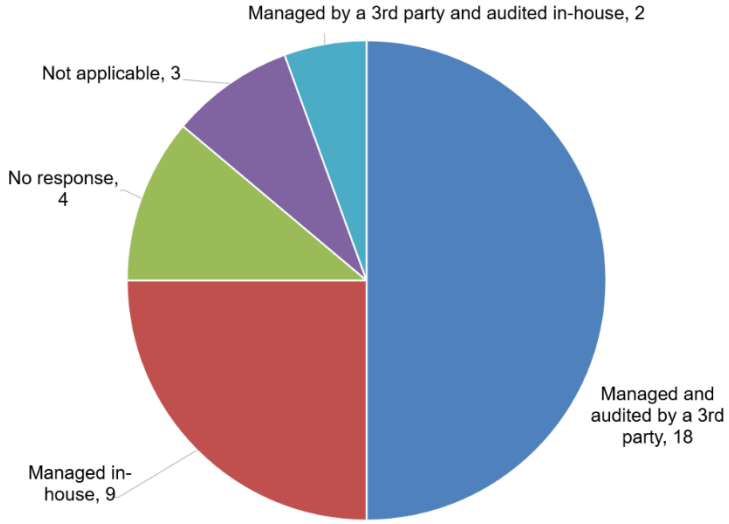

Figure 4-21: Biosolids End Use Risk Management (Plant Count)

Landfilling of biosolids is generally managed by a third party, and accounts for most of the results in this category.

4.12 Biosolids Transactions

The proportion of WWTPs paying for biosolids disposal, or receiving payment, is presented in Figure 4-22.

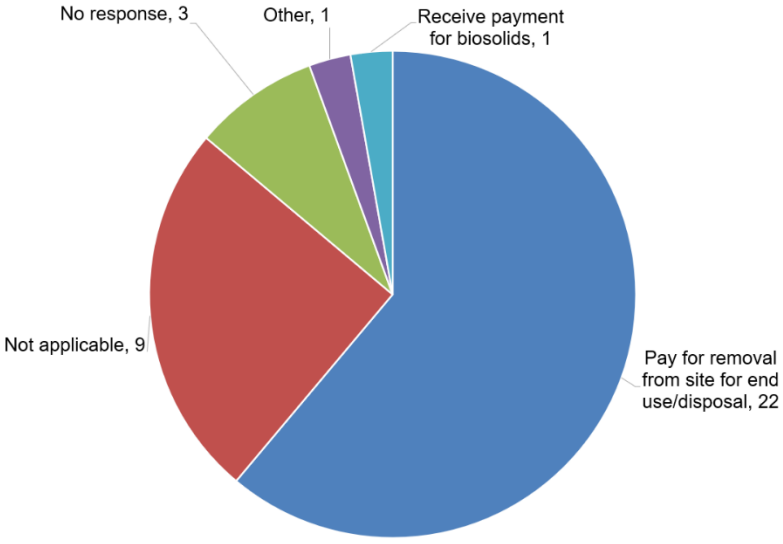

Figure 4-22: Biosolids Payments (Plant Count)

The sale and branding status of biosolids is shown in Figure 4-23.

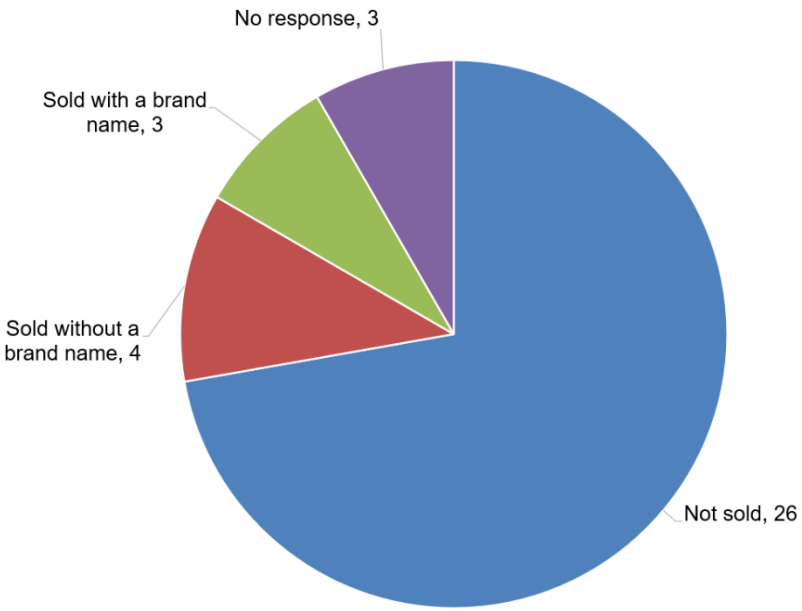

Figure 4-23: Biosolids Sale and Branding (Plant Count Basis)

As shown in Figure 4-22, biosolids disposal is generally a cost to WWTPs, with only one treatment plant (New Plymouth) receiving payment for biosolids.

Three WWTPs reported biosolids being sold with a brand name while four reported biosolids being sold unbranded. The large number of plants where biosolids are not sold illustrates the opportunity that exists in New Zealand to increase the beneficial use and value of biosolids across the country.

4.13 Industry Risks and Opportunities

The occurrence of various risk and opportunity themes received in the survey responses are presented in Figure 4-24 and Figure 4-25 respectively.

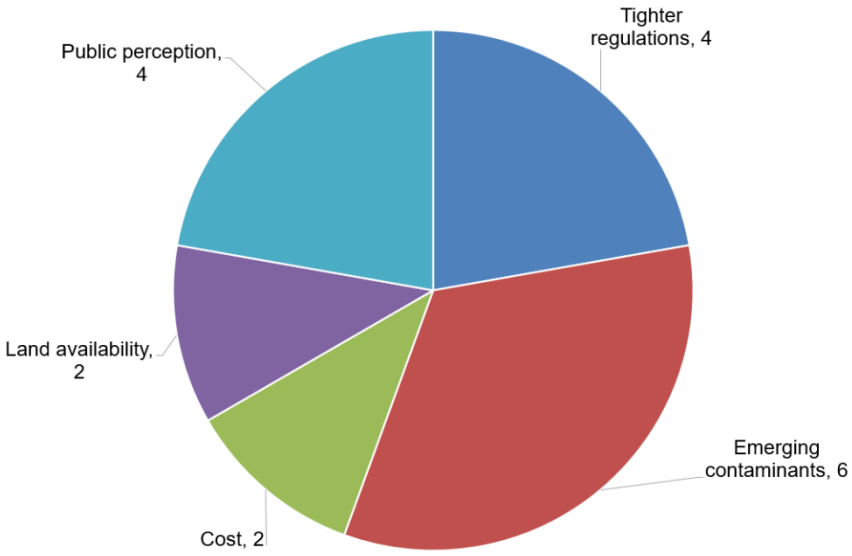

Figure 4-24: Biosolids Risks – Survey Response Themes (number of comments received)

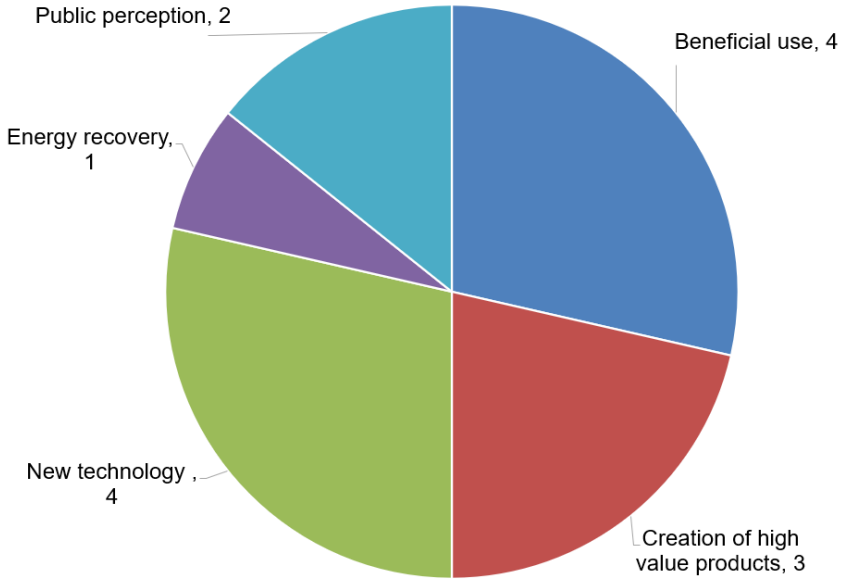

Figure 4-25: Biosolids Opportunities – Survey Response Themes (number of comments received)

Emerging contaminants such as microplastics and PFAS are again the most cited risk, along with tighter regulations and adverse public perception of biosolids. These themes came through strongly in the 2023 survey. Public perception was seen as both a risk and an opportunity (to improve). Opportunities were seen in using emerging treatment technologies such as pyrolysis and gasification to increase beneficial use and the creation of high value products. There was less diversity is responses compared with the 2023 survey.

5 Additional Questions

New Biosolids Guidelines for New Zealand (December 2025)

Finalised in December 2025, the Water NZ Guideline for Beneficial Use of Biosolids on Land guidelines replace the 2003 guidelines, introducing a risk-based framework, updated stabilisation and contaminant grading, improved alignment with iwi Māori and community perspectives, and soil-ecology protection.

Six out the 36 respondents said that they had reviewed the new guidelines, with two having adopted or were in the process of adopting them. Most gave no response or stated they had yet to review them, reflecting the newness of the guidelines. In the next survey it is expected that most, if not all respondents will have either reviewed or adopted the new guidelines.

National Wastewater Environmental Performance Standards (December 2025)

Taumata Arowai had issued draft national wastewater environmental performance standards in April 2025 covering discharge to water, discharge to land, beneficial use of biosolids, and network overflows and treatment plant bypasses. These have since been passed into law in December 2025. The survey asked about expectations of likely changes in quality or quantity of biosolids when new resource consents are granted based on the wastewater environmental performance standards.

All of those surveyed gave either no response or a “not appliable’ response, indicating the new treatment standards are not currently seen as an issue for biosolids generation (as compared to disposal / use) in New Zealand.

6 Conclusions

The results from the 2025 Australia and New Zealand Biosolids Partnership (ANZBP) New Zealand biosolids survey are largely consistent with those from the last survey in 2023. Some key points emerging from this survey are:

- Total biosolids production increased slightly (7%) from the 2023 survey while per capita production remained fairly stable compared with previous results
- Excluding the Mangere WWTP quarry monofill, landfilling of biosolids remains the largest biosolids end use on both a solids production and plant count basis. However the proportion of biosolids turned into compost for landscaping has increased since the 2023 survey.
- 56% of biosolids achieved Grade B stabilisation and 9% achieved Grade A stabilisation reflecting the common use of anaerobic digestion in large New Zealand cities, and to a lesser extent thermal drying and vermicomposting which produces Grade A.
- The recently released 2025 biosolids guidelines have yet to be widely adopted by the industry which is to be expected given the limited time since they have been finalised.
- As in previous surveys, emerging contaminants and tighter regulations are key concerns in the industry while new technologies and beneficial / high value uses for biosolids are seen as the major future opportunities.

7 Acknowledgements

Stantec and Ekistica, and the Australian & New Zealand Biosolids Partnership greatly appreciate the valued input, time, and effort of those local authorities and utilities who have contributed to this 2025 survey.

8 References

NZWWA (2003) Guidelines for the Safe Application of Biosolids to Land in New Zealand.

NZ Government (2025) Water Services (Wastewater Environmental Performance Standards) Regulations 2025

Water NZ (2025) Guideline for Beneficial Use of Biosolids on Land.

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