



Environment Protection Authority

NSW Biosolids Regulatory Review

Issues Paper



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Cover: Biosolids stockpile on a bunded hard-stand, Nowra; Photo Alison McVey/EPA

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Acknowledgement of Country

The NSW Environment Protection Authority acknowledges that Aboriginal people have a spiritual and cultural connection and an inherent right to protect the land, waters, sky and natural resources of NSW. This connection goes deep, and has since the Dreaming.

The entire landscape, including traditional lands, fresh water and seas, has spiritual and cultural significance to Aboriginal people. If the cultural and spiritual values of Aboriginal people are sustained by providing protection and respect, then many other components of Aboriginal life will be healthy. By this understanding there is no separation of Country, culture, waters and wellbeing. The health of the natural environment, fresh waters, land animals, marine animals and people is intimately connected.

The EPA recognises the connection of Aboriginal people to their land, their waters and surrounding communities and acknowledges their history and cultures here on this land.

We also acknowledge our Aboriginal and Torres Strait Islander employees are an integral part of our diverse workforce and recognise the knowledge embedded forever in Aboriginal and Torres Strait Islander custodianship of Country and culture.

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Biosolids are a resource for use in agriculture, land rehabilitation and in landscaping products. They can also contain harmful chemicals, pathogens and other contaminants. Biosolids need to be carefully treated and managed to ensure that when applied to land they are both safe and beneficial.

We are reviewing our regulatory approach to biosolids to ensure it continues to protect human health and the environment.

Acronyms

BHC	benzene hexachloride
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
EfW	energy from waste
ERA	ecological risk assessment
HACCP	'hazard analysis critical control point' is a safety system that identifies, evaluates and controls hazards from source to exposure
HHCB	galaxolide
HHERA	human health and ecological risk assessment
MASCC	maximum allowable soil contaminant concentration
MoS	margin of safety
NEMP	National Environmental Management Plan
NSW EPA	NSW Environment Protection Authority
PE	polyethylene
PET	polyethylene terephthalate
PFAS	per-and poly-fluoroalkyl substances
PFHxS	perfluorohexane sulfonate
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
POP	persistent organic pollutant
QMRA	quantitative microbial risk assessment
STPs	sewage treatment plants
WARR	waste avoidance and resource recovery
WaSM	NSW Waste and Sustainable Materials Strategy 2041

1. Introduction

1.1. Purpose and scope of this issues paper

The current guidelines for the management of biosolids in NSW are the *Environmental Guidelines: Use and Disposal of Biosolids Products* (NSW EPA 1997) (Biosolids Guidelines). Since the guidelines were published, the types of contaminants entering sewerage systems have changed. So too has our understanding of the risks and emerging opportunities associated with biosolids.

Because of these changes, we (the NSW EPA) decided to review the Biosolids Guidelines. The review comprised a number of different studies that looked at all aspects of the Biosolids Guidelines. The findings of the review are presented in detail in a companion paper, *NSW Biosolids Regulatory Review: Technical Findings Report*.

Through this issues paper, we are inviting comment on the whole regulatory approach for biosolids.

This paper is informed by peer-reviewed research and best-practice approaches that may be useful in the future management of biosolids in NSW. It presents the EPA's research findings to date and poses questions to draw out further discussion and insights from stakeholders.

1.2. Why we need a new regulatory approach

Current knowledge indicates there is a potential risk to the environment and human health from the application of some biosolids to land used for certain purposes. This risk is discussed in detail in *NSW Biosolids Regulatory Review: Technical Findings Report*. We need to ensure our regulatory tools and actions adequately address any potential harm to human health and the environment.

Through this issues paper, we are seeking your views on matters such as:

- new approaches for the classification and stabilisation of biosolids
- the need to regulate chemicals that are no longer used
- the need for regulation of known and emerging contaminants
- the need to review our regulatory approach to ensure that it is fit for purpose and contains clear guidance for stakeholders on how to beneficially re-use biosolids.

Your views and feedback on

- the findings and recommendations of the Biosolids Guidelines review
- the questions outlined in this issues paper
- any other matters related to the current regulatory settings for the land application of biosolids

will help shape our consideration and preparation of any new regulatory approach.

1.3. Request for submissions

To make a submission, please visit the [Have Your Say consultation portal](#).

The companion paper, *NSW Biosolids Regulatory Review: Technical Findings Report*, should be read in conjunction with this issues paper.

If you have questions about any matters raised in this issues paper, please contact:

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2. Current production and regulation of biosolids

2.1. Biosolids production and use in NSW

Questions

1. What is your experience with the end use of biosolids? Are you directly affected by the biosolids end-use market? If so, how?

In 2021–22 we conducted a survey of the biosolids produced at all licensed NSW sewage treatment plants (STPs) in 2019 and 2020. The majority of licensees responded, providing data for 220 STPs operating in NSW, which have a wide range of capacities, treatment processes and stabilisation methods. The survey found that NSW STPs produced just over 80,000 dry tonnes of biosolids a year, and more than half of this production was used for agricultural purposes. Sixty per cent of the STPs had trade waste agreements, allowing a wide range of industries to dispose of their waste to the sewerage system.

2.2. Legislative framework

Questions

2. What are your views on our current regulatory approach to the use of biosolids? How could our approach be improved or made more effective? What aspects should be retained?

2.2.1. Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) is the primary environmental legislation in NSW under which the generation, treatment, use and disposal of biosolids are regulated. Among other things, the POEO Act sets the framework to ensure that the environment and human health are protected from the inappropriate use of waste. It establishes management and licensing requirements, sets out offences and penalties, and sets various waste management requirements through regulation.

2.2.2. Orders and exemptions

The Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation) provides for orders and exemptions for the use of biosolids.

- Resource recovery **orders** set the requirements that generators and other suppliers must meet for biosolids to be supplied for land application. We regulate the supply of biosolids for land application under the *Biosolids Order 2014* (Biosolids Order), issued under the Waste Regulation.
- Resource recovery **exemptions** provide exemptions from particular licensing and other provisions for the occupiers of premises where biosolids are applied to land. We regulate the land application of biosolids under the *Biosolids Exemption 2014* (Biosolids Exemption). Like the Biosolids Order, this is issued under the Waste Regulation.

Both the Biosolids Order and the Biosolids Exemption require the biosolids to which they apply to comply with the Biosolids Guidelines.

The Biosolids Guidelines prescribe the requirements for applying biosolids products to land, including threshold limits for contaminants and stabilisation requirements to manage pathogens.

In accordance with the NSW EPA's resource recovery framework, resource recovery exemptions and orders are only appropriate if the re-use of any waste:

- is genuine, rather than a means of waste disposal
- is beneficial
- will not cause harm to human health or the environment.

Other related strategies and policies

NSW EPA Strategic Plan 2021–24

The Strategic Plan 2021–24 has five areas of focus, including legacy and emerging contaminants. It identifies the need to proactively manage high-risk legacy, current and emerging contaminants resulting from chemicals used in different industry settings.

The EPA has committed to taking action to reduce the impact of waste and contaminants on the environment. It also supports industry to identify hazards, assess risks, and implement effective controls to protect the environment and the community from contaminants.

Waste and Sustainable Materials Strategy 2041 (WaSM)

The WaSM sets out key focus areas regarding waste and sustainable materials, including commitments to:

- reduce carbon emissions through better waste and materials management
- recover 80% of all waste by 2030
- halve the amount of organic waste sent to landfill by 2030.

Circular Economy Policy

The policy sets out the path towards a circular economy and aims to design out waste and pollution, keep materials in use and regenerate natural systems.

Waste Avoidance and Resource Recovery Act 2001 (WARR Act)

The WARR Act promotes waste avoidance and resource recovery to achieve a continual reduction in waste generation. The WARR Act sets out the hierarchy for waste management, prioritising waste avoidance and reduction as the first option, followed by re-use, recycling, processing or reprocessing waste, energy recovery and then (the least preferred option) disposal.

NSW Energy from Waste Policy Statement (EfW policy)

The EfW policy sets out the framework and technical criteria to be met by facilities proposing recovery of energy from thermal treatment of waste.

3. Biosolids Guidelines review: findings and recommendations

This section summarises the EPA’s review of the Biosolids Guidelines. More detail can be found in the companion paper, *NSW Biosolids Regulatory Review: Technical Findings Report*.

3.1. Definition of biosolids

Question

3. What are your views on the current definitions of biosolids?

We are considering amending the definition of biosolids found in Schedule 1 to the POEO Act. The current definition is:

biosolids means the organic product that results from sewage treatment processes (sometimes referred to as sewage sludge).

This definition of biosolids includes ‘sewage sludge’. However, sewage sludge may be more accurately described as the matter remaining when most of the liquid component of influent to a sewage treatment plant is removed. Sludge is pathogenic, unstable, odorous, contaminated, and unsuitable for beneficial re-use. It requires further treatment to produce biosolids.

Most other Australian jurisdictions (NT, SA, WA, Tas, Vic) distinguish between sewage sludge and biosolids. Their definitions of biosolids make clear that a product derived from sewage sludge has to be adequately treated before it can be considered to be biosolids.

3.2. Classification system

Question

4. How will the proposed new classification system for biosolids management affect you?

Biosolids are currently classified using a risk-based approach that takes into account both their contaminant grade and their stabilisation grade.

The **contaminant grade** is determined by the concentrations of a suite of contaminants. Contaminant grading requires analysis of a representative number of samples for a prescribed suite of chemical contaminants including heavy metals, pesticides and polychlorinated biphenyls. Contaminant grades run from A (lowest concentrations) to E (highest concentrations).¹

The **stabilisation grade** is determined by which treatments the product has had applied to reduce pathogens and vector attraction (e.g. attractiveness to flies and rodents), and analysis against microbiological standards.

¹ Table 3-1 in the Biosolids Guidelines lists the contaminant suite and respective thresholds to achieve gradings A–E.

To determine the contaminant grade, biosolids producers need to:

- have an established sampling regime with appropriate numbers of samples and sampling frequencies
- use accredited laboratories to test for contaminant concentrations
- statistically analyse the test results
- assess against the contaminant acceptance thresholds.

As mentioned earlier, in 2021–22 the NSW EPA conducted a survey of the biosolids produced at all licensed NSW sewage treatment plants (STPs) in 2019 and 2020. The survey showed that some licensees were unsure of their sampling and testing responsibilities to classify biosolids in accordance with the Biosolids Guidelines.

The companion paper, *NSW Biosolids Regulatory Review: Technical Findings Report*, gives more details of the classification system.

We invite your feedback on the grading and classification framework. After we have reviewed the framework, we will re-examine the sampling requirements under the Biosolids Guidelines, considering other sampling approaches.

3.2.1. Permissible end uses

Different classes of biosolids have different permissible end uses, with lower-quality material having fewer uses. Table 1 summarises the current classification system and end uses.

Table 1 Current biosolids classification system (per the Biosolids Guidelines)

Classification	Contaminant grading (minimum)	Stabilisation grading (minimum)	End-use option
Unrestricted use	A	A	all
Restricted use 1	B	A	2–9
Restricted use 2	C	B	4–9
Restricted use 3	D	B	6–9
Not suitable for use	E	C	7–9

1. home lawns and gardens
2. public contact sites (e.g. recreational parks)
3. urban landscaping (e.g. council land)
4. agriculture
5. forestry
6. soil and site rehabilitation (e.g. abandoned mines)
7. surface land disposal (e.g. within the STP licensed premises)
8. reprocessing (e.g. composting)
9. landfill disposal

3.2.2. Proposed simplification

To simplify the classification system, the EPA is considering the changes outlined in Table 2, including to:

- reduce the number of both contaminant and stabilisation grades
- reduce the number of classifications (from five to three)
- adopt new terminology – Class I, II and III biosolids.

Table 2 Proposed biosolids classification system, with permitted end uses

Current classification	Proposed classification	Contaminant grading (minimum)	Stabilisation grading (minimum)	End-use option
Unrestricted use	Class I	C1	S1	all
Restricted use 1	Class I	C1	S2	2–9
Restricted use 2	Class II	C2	S2	3–9
Restricted use 3	Class III	ungraded	ungraded	8–9
Not suitable for use	Class III	failed C2	failed S2	-

Most NSW biosolids are expected to fall under Class II. We propose that these be considered suitable for applying to agricultural land, provided other requirements for land management are met. Class III will describe biosolids that are not suitable for applying to land. These biosolids will have to be either disposed of, or further processed to reduce pathogens and reclassified as Class I or II to make them suitable for applying to land.

3.3. Chemical contaminants in NSW biosolids

Questions

5. If the EPA were to introduce the regulatory thresholds for contaminants in Tables 3 and 4, how would this impact your management of biosolids?

6. Do you have any views on whether the EPA should target its regulatory approach upstream of STPs to minimise the inputs of known and emerging chemicals into sewerage systems? If so, how?

The Biosolids Guidelines list a number of chemical contaminants that must be tested for in biosolids. Since 2016 we have actively investigated whether:

- any of the contaminants currently listed could be removed because they are of sufficiently low risk
- which other chemical contaminants should be regulated.

We have undertaken or commissioned a number of studies for this purpose. The companion paper, *NSW Biosolids Regulatory Review: Technical Findings Report*, describes these studies in detail. They are summarised below.

- A **review** of contaminants of concern in biosolids applied to land and the associated risks to agriculture, human health and the environment (the Contaminants Review).² The outcome of this study resulted in the prioritisation of a short list of potential contaminants of concern for measurement in NSW.
- A **STP sampling campaign**. As a follow-on to study (i), the Contaminants Review, in May 2017 the EPA sampled

² *Environmental Guidelines: Use and Disposal of Biosolids Products – Contaminant Review* (the Contaminants Review). (Available on the EPA website.)

7. What suggestions do you have on how the NSW EPA could regulate and manage future unknown and emerging chemical risks?

biosolids from 20 NSW STPs across NSW, in both rural and urban locations. The samples were analysed for 12 emerging contaminants that are not currently included in the Biosolids Guidelines, including per- and polyfluoroalkyl substances (PFAS).

- iii. **Human health and/or ecological risk assessments** (HHERAs) for five prioritised contaminants.^{3,4} Following its 2017 sampling campaign, the EPA asked the Department of Planning and Environment (DPE) to consider the results of the sampling campaign. DPE prioritised five of the emerging contaminants for further investigation and conducted HHERAs for them. Following the outcome of the HHERAs, DPE recommended regulating the prioritised contaminants in NSW biosolids and derived proposed regulatory limits for them.⁵
- iv. **A review of heavy metals** currently regulated in NSW biosolids to determine whether the regulatory thresholds remain appropriate.
- v. **Preliminary analysis of persistent organic pollutants** (POPs). These substances include polychlorinated biphenyls (PCBs), certain organochlorine pesticides (DDT/DDD/DDE), aldrin, chlordane, dieldrin, heptachlor, hexachlorobenzene (HCB), lindane and benzene hexachloride (BHC).

Additional sampling. The results of the survey conducted in 2021 helped shape the direction of a comprehensive biosolids sampling project of 75 STPs that was carried out from March to May 2023. We have also requested biosolids data from all STP licensees. The results will provide a better understanding of the chemical load in various catchments.

Studies (i)–(vi) above led to the development of proposed thresholds for heavy metals (Table 3) and a new suite of chemical contaminants (Table 4).

We intend to continue regulating POPs for the present as the 2017 sampling campaign detected them in biosolids at concentrations of concern (the main POPs detected in the 2017 sampling campaign were chlordane, dieldrin and PCBs). However, when evidence shows that certain contaminants are no longer relevant for biosolids, we will stop monitoring for them.

³ *NSW Biosolids Guideline Review: Identification of key exposure pathways to assess risks from PFAS in biosolids.* (Available on the EPA website.)

⁴ *NSW Biosolids Guideline Review: Identification of key exposure pathways to assess risks from HHCB, triclosan, chlordane and PBDEs in biosolids.* (Available on the EPA website.)

⁵ *NSW Biosolids Guideline Review: Threshold derivation for contaminants in biosolids – PFAS, HHCB, triclosan, PBDEs and chlordane.* (Available on the EPA website.)

Table 3 Proposed concentration limits for contaminant grades C1 and C2 and the maximum allowable soil contaminant concentrations (MASCC) (mg/kg dw)

Heavy metal	C1	C2	MASCC
Arsenic	20	20	20
Cadmium	1	5	0.5
Copper	150	1,000	100
Chromium (total)	100	500	100
Lead	150	420	150
Mercury	1	4	1
Nickel	60	270	60
Selenium	5	50	5
Zinc	200	1,000	200

Table 4 Risk-based contaminant thresholds for unrestricted use biosolids, restricted use biosolids and MASCC at three margins of safety

All concentrations are shown in µg/kg.

Contaminant(s)	Margin of safety	Unrestricted use threshold*	Restricted use threshold	MASCC
PFOS+PFHxS	5	0.22	6.2	0.22
	2	0.55	15	0.55
	1	1.1	31	1.1
PFOA [#]	5	2	54	2
	2	5	130	5
	1	10	270	10
HHCB	5	150	4,000	150
	2	375	10,000	375
	1	750	20,000	750
Triclosan	5	13	350	13
	2	32	870	32
	1	65	1,700	65
Br1-Br9	5	1.0	28	1.0
	2	2.6	70	2.6
	1	5.1	140	5.1
Br10	5	5,600	260,000	9600
	2	14,000	650,000	24,000
	1	28,000	1,300,000	48,000
Chlordane	5	0.78	21	0.78
	2	1.9	52	1.9
	1	3.9	100	3.9

* Unrestricted use thresholds should be applied to the final biosolids product.

PFOA thresholds and MASCCs were derived to protect ecological secondary consumers and are based on a soil-screening criterion (adjusted) from the United Kingdom. Work for the PFAS National Environment Management Plan (NEMP) derived a PFOA soil-screening criterion for indirect exposure (secondary consumers). After NEMP 3.0 is published, the EPA will update its proposed criterion to align with that.

3.4. Pathogens in NSW biosolids

Question

8. What is your view on implementing a HACCP approach for pathogen management and why?

3.4.1. Review of pathogen risks

Pathogens in biosolids can pose risks to human health and the environment. To start our review of these risks, we commissioned a study that looked at:

- the occurrence of pathogens in biosolids under both established and potential pathogen-reduction processes
- management practices that reduce pathogen risk
- policies and practices in other Australian jurisdictions and overseas.⁶

The review recommended that:

- the EPA apply an appropriate selection of microorganisms for monitoring
- any high-risk sources of pathogens affecting people or livestock be identified within a catchment, to enable notification and management of risks
- a hazard analysis and critical control points (HACCP) approach be adopted for the management of pathogens⁷
- there not be undue reliance on point-of-use controls.

3.4.2. Quantitative microbial risk assessment

Building on the findings of the initial review, we commissioned a quantitative microbial risk assessment (QMRA) to quantify the human health risks associated with the beneficial use of biosolids.⁸

The first step in a QMRA is to determine the concentrations of individual pathogens in raw sewage. A mathematical model is then applied to estimate how these concentrations change in response to sewage and sludge treatment processes. Depending on the end use of biosolids and the estimated exposure of people to biosolids, the likelihood of infection and illness can be determined and compared with a health-based performance target.

⁶ *Environmental Guidelines: Use and Disposal of Biosolids Products – Pathogen Review*. (Available on the EPA website.)

⁷ HACCP (hazard analysis critical control point) is a management system in which product safety is addressed through the analysis and control of biological hazards from the raw material through to the finished product. The goal of HACCP is to prevent and reduce the occurrence of safety hazards.

⁸ *QMRA to inform the approach for regulating pathogens as part of the NSW Biosolids Guidelines Review*. (Available on the EPA website.)

The QMRA showed that microbial safety targets can be achieved by (i) ensuring good management and control of the critical operational conditions at an STP (e.g. residence time, temperature, pH) and (ii) appropriate biosolids treatment processes. Using a QMRA approach to define health-based performance targets for the safe re-use of biosolids will allow for a flexible risk management framework. Combinations of treatment and controls that are specifically relevant to the local context can be implemented to achieve safety.

The QMRA study made a number of recommendations which can be found in the *NSW Biosolids Regulatory Review: Technical Findings Report*. They include:

- reviewing data on pathogen concentrations in biosolids from local sewage treatment plants, especially in small and regional communities
- running targeted data collection programs across NSW to quantify the magnitude (and variability) of infectious pathogens in sewage, raw sludge and biosolids products
- undertaking a quantitative literature review of published LRVs ($\log_{10}$ reduction values – a measure to quantify pathogen reduction) for processes and controls that follow the proposed guidelines
- quantifying pathogen LRVs for different sludge and biosolids treatment processes and linking pathogen reduction to measurable process variables.

3.5. Stability and odour management

Questions

9. What are your views on the proposed recommendations to manage odour and stability? What other methods do you suggest?

We started our assessment of current stability and odour requirements by commissioning a review (the Stability Review).⁹ This looked at:

- what constitutes 'stable' biosolids
- the suitability of existing methods to measure stability
- the link between biosolids' stability and odour
- how NSW's policies and practices compare with those of other jurisdictions.

The Stability Review considered stabilisation to be irreversible changes associated with the processing of raw sludge to transform the organic matter and reduce putrefaction (which causes odours). Aerobic digestion, anaerobic digestion and composting can be considered as true stabilisation processes. Other processes, such as addition of lime and thermal drying, remove pathogens but do not yield a fully stabilised product, meaning pathogens can regrow and cause odours during transport and processing.

⁹ *Assessment and management of material stability in contemporary Environmental Guidelines for the Use and Disposal of Biosolids Products* (the Stability Review). (Available on the EPA website.)

The Stability Review made several recommendations. They include that:

- a best-practice manual for NSW biosolids management be developed. This would list processes that ensure a stable product or which require the use of a risk-based management tool such as HACCP
- minimum sludge retention times be required for anaerobic and aerobic digestion, to reduce the risk of nuisance odours
- stability be assessed after dewatering, transport and storage, as these practices may make biosolids less stable
- a range of methods be used to evaluate odour at different stages of processing.

3.6. Review of land management controls

Questions

10. Is there a need to change land management practices to ensure that the land application of biosolids is protective of the environment and non-polluting? How?

Section 4 of the Biosolids Guidelines covers the beneficial land application of biosolids. It includes requirements relating to the land on which biosolids may be applied, and management controls to ensure the application is beneficial and any impact to the surrounding environment and community is minimised. These controls include soil characteristics, exclusion/withholding periods, and buffer zones to protect sensitive sites from any impacts of biosolid use.

11. Do you have any comments about which controls should be made mandatory vs optional and in what circumstances? Why?

We reviewed these requirements to determine which land management controls are appropriate. We examined the scientific literature and compared NSW's approach to that of other jurisdictions. In some cases, NSW has greater restrictions.¹⁰ We are considering which current controls should be mandatory and which regulatory tools are needed to ensure best practice.

3.7. Impacts of microplastics in biosolids

Question

12. What regulatory or other approaches would you like to see the EPA consider to address microplastic and other contaminants in domestic and trade waste inputs to sewerage systems?

The EPA and other regulatory agencies have started investigating the presence and impacts of microplastics in the environment. Microplastics (0.001 mm–5 mm) are a physical contaminant that accumulate over time and may interfere with biological processes and ecosystems. Their risks to ecosystems and human health differ according to their particle size, morphology, colour, additives and polymer type.

At present microplastics are not regulated in biosolids in NSW (or elsewhere), although flexible plastic particles above 5 mm and rigid plastic particles above 2 mm are regulated in compost.

¹⁰ For example, NSW currently has a five-year withholding period for crops grown below the soil surface (such as potatoes and carrots), while Victoria has a similar restriction of only three years.

The EPA commissioned a study to quantify microplastics in wastewater influent and effluent (published in 2020) and included a one-off assessment of biosolids from seven STPs in the Sydney region.¹¹ This study compared the effect of wastewater treatment methods at primary and tertiary STPs on the removal of microplastics. The tertiary treatment processes were found to be more effective in removing microplastics from effluent (noting that the microplastics then partition more to the biosolids). The study also found that three common wastewater contaminants (benzalkonium chloride, bisphenol A and triclosan) bound strongly to polyethylene (PE) and polyethylene terephthalate (PET) microplastics.

4. Looking forward: the future of biosolids regulation in NSW

4.1. Objectives

In developing any new regulatory approach to the management of biosolids, our objectives are to:

- identify opportunities to improve the quality of biosolids
- maximise opportunities for the beneficial use of biosolids
- ensure that the land application of biosolids in NSW does not present an unacceptable risk to human health and the environment
- continue to keep the community safe by monitoring for unknown and emerging risks
- ensure a strong circular economy in the medium to long term.

4.2. Tools and actions

Question

13. What elements would you like to see in a new regulatory approach (e.g. education, grants, partnerships, behaviour change, product stewardship), and why?

In designing a new regulatory approach to biosolids, we may decide to use a combination of tools and actions to achieve improved outcomes for the environment and human health. For example, we may decide to combine regulatory and policy requirements with increased education, behaviour change, product stewardship programs, industry and science partnerships, and enabling tools such as grants.

¹¹ *Microplastics quantification in waste water – Wastewater influent and effluent trends over a 10 month period* (Available on the EPA website.)

4.3. Consultation with our stakeholders

We want to ensure any new regulatory approach we adopt is evidence-based and designed in consultation with our stakeholders.

Our regulatory approach to biosolids needs to consider the market for biosolids, including existing supply and demand chains and any market barriers. In January 2023, we commissioned an analysis of the biosolids market in NSW. Findings are expected in late 2023.

We have also embarked on a jurisdictional review of biosolids management, contacting other regulators across Australia and internationally to better understand how biosolids are regulated elsewhere and what lessons can be learned.

Feedback on this issues paper will inform roundtable discussions with stakeholders. These discussions are an opportunity for us to gain further insights, answer any questions and conduct further consultation with our stakeholders.

We are learning more about the risks associated with biosolids. We need to act on this knowledge, to ensure the environment and human health is protected.

4.4. How will we develop the new regulatory approach?

The EPA's regulatory approach to any environmental or human health issue is underpinned by eight elements (Figure 1). We listen, educate, enable, act, influence, require, monitor and enforce.

Our regulatory framework will guide us in developing a new regulatory approach for biosolids.¹² We will actively engage with stakeholders throughout this process and encourage feedback.

Following your input, we will release a summary of what we have heard, together with an indicative timeline for developing the proposed new regulatory approach.

Figure 1 The eight elements of the NSW EPA's approach to regulation



Our new regulatory approach is likely to involve a combination of these elements. For example, science partnerships with research organisations will help us address legacy and emerging contaminants, while increased education and awareness for biosolids producers, processors, consumers and the community will complement the way we regulate and generate better outcomes.

¹² The EPA's regulatory framework outlines our purpose, guiding principles and approach to improving the environment and human health outcomes. The framework describes many of the tools we use and regulatory actions we may take under each of the eight elements of our regulatory approach. (Available on the EPA website.)