Ministry for the Environment
Manatū Mō Te Taiao

PROPOSED
National Environmental Standard
>> for On-site Wastewater Systems

DISCUSSION DOCUMENT



New Zealand Government

Proposed National Environmental Standard for On-site Wastewater Systems

Discussion Document

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Executive Summary

On-site wastewater systems provide treatment of domestic wastewater and return it to the environment within the boundaries of the property of origin. It has been estimated that in some regions at least 20 per cent of homes rely on this form of wastewater treatment. Ageing septic tanks represent the majority of on-site wastewater systems installed in New Zealand. In many areas wastewater systems are not providing adequate levels of treatment and are having an adverse impact on human health and the environment. Failing systems can:

- create human health risks from the overflow or ponding of effluent
- contribute to lakes, rivers, estuaries and beaches becoming unfit for swimming, gathering seafood, and marine farming
- lead to contamination of groundwater and surface water supplies, which affects the quality of drinking-water supplies and may increase the occurrence of algal blooms.

These effects occur because of a range of factors, including poor maintenance, sensitive receiving environments (lakes, rivers, streams, etc.), high-density residential areas, shallow groundwater, and unsuitable soil types. Ongoing maintenance backed up by regular inspections can play a significant role in improving the performance of wastewater systems.

The Ministry for the Environment aims to improve the management and environmental performance of domestic on-site wastewater systems to reduce the risks to human health and the environment. This discussion document assesses different policy options for improving the management and environmental performance of on-site systems, such as using non-regulatory measures, amending existing legislation, developing a national policy statement, and developing a national environmental standard.

The discussion focuses on a national environmental standard (the proposed standard) as the preferred option to achieve the objective. In essence, the proposed standard is that:

> *Owners of properties with on-site wastewater systems in specific locations will be required to hold a current warrant of fitness that confirms their on-site system is functioning properly and is being maintained to an appropriate standard.*

The proposed standard would authorise regional councils to implement a scheme that requires property owners with an on-site system to hold a current warrant of fitness (WOF) for their system. To obtain a WOF, a system will be required to pass an inspection. Inspections will be carried out every three years.

The proposed standard would apply to domestic on-site systems that are operated as permitted activities under rules in regional plans. However, your views are sought on whether the proposed standard should include other systems, such as commercial on-site systems or systems covered by a resource consent.

The application of the proposed standard to every property in New Zealand with an on-site wastewater system was considered. However, council experience shows that the cumulative effects of multiple systems or systems in high-risk or sensitive areas are the ones that generally lead to health risks and environmental degradation. Also, an initial cost−benefit assessment indicated that the costs of applying a proposed standard to every domestic home that relies on an on-site system would significantly outweigh any potential benefits. Applying a standard to 'everyone everywhere' would create significant pressures on local government resources and would mean that only limited resources could be focused on the problem areas.

The refined proposal would target areas that have known problems with the performance of on-site systems, or where there is an actual or potential risk to the environment from higher densities of on-site systems.

A national environmental standard is a legally enforceable regulation. The exact wording of any standard will be drafted by Parliamentary Counsel if, after public submissions,, the Minister for the Environment decides to recommend to the Governor-General that a standard be made. This discussion document provides more detail on the proposed subject matter of the standard to help people prepare formal submissions.

Any person can make a submission on the proposed standard.

Submissions must be received by the Ministry for the Environment no later than 5.00pm on 26 September 2008.

Further details on making a submission are included in section 8.

1 Introduction

1.1 Background

Several studies and surveys carried out in recent years in New Zealand have revealed that a large number of on-site wastewater systems are not performing in a way that provides acceptable levels of treatment of domestic wastewater. For example, a recent study commissioned by the Ministry for the Environment concluded:

> *There are in the order of 250 communities across the country with significant numbers of failing on-site wastewater treatment systems. These communities comprise a total of about 42,000 houses. This estimate does not include isolated rural dwellings.* (EMS Ltd, 2007)

In many cases the failure of on-site systems to treat wastewater adequately is due to property owners not really knowing how to maintain and operate their systems. Discharges of untreated or partially treated wastewater from on-site systems are causing public health risks and negative environmental effects in most regions in New Zealand, and there is growing concern by local government about how to manage these situations.

The development of technical documents such as AS/NZS 1547:2000 and the Auckland Regional Council's TP58[1] over the last decade has seen a major advance in the design and installation of on-site wastewater systems. However, many issues still remain. Multiple pieces of legislation and a lack of clarity of roles between local and regional councils often mean failing systems go unchecked, and there is often no incentive for system owners to maintain their systems to a level that treats the effluent to an adequate standard.

Local authorities have asked the Ministry for the Environment to develop tools to help them manage on-site wastewater systems and their effects.[2] In response to these requests, the Ministry commissioned an investigation into on-site wastewater management, with the following objectives:

- to define the environmental effects and other issues associated with on-site wastewater systems
- to identify and assess options to best manage on-site wastewater systems for the purpose of reducing their adverse environmental and health impacts
- to scope options for the management of on-site wastewater systems that could be addressed by a national environmental standard.

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[1] AS/NZS 1547:2000 On-site Domestic Wastewater Management, Auckland Regional Council Technical Publication TP58, *On-site Wastewater Treatment Systems: Design and Management.*

[2] 2005 and 2006 Talk Environment Roadshow feedback.

The investigation involved a survey of all regional councils (including unitary authorities) and a selection of territorial local authorities to identify problems and relevant issues. During a one-day workshop in June 2005, attended by over 30 local government and industry representatives, the problems, issues and options for management were presented and discussed. Participants at the workshop identified priorities and discussed the suitability of different management options, including the use of national environmental standards.

The findings from the investigation were compiled in a report, *Issues and Options for the Management of On-site Wastewater Systems* (Duffill Watts and King et al, 2005), which identified 25 issues related to on-site wastewater management. These were condensed into seven broad themes:

- lack of communication between local authorities, and unclear roles
- inadequate training and education of designers, installers, regulators and maintenance personnel
- insufficient general knowledge about the performance of different systems and lack of information about the locations and types of systems
- inconsistencies in the requirements for treatment systems and the management process among local authorities
- inadequate and inconsistent assessments of whether the type of system proposed is the best practicable option
- gaps in the operation, maintenance and performance monitoring of systems
- ensuring adequate levels of treatment performance from primary and secondary treatment units and disposal systems.

Of the seven main themes identified, two were considered potentially appropriate for management using a national environmental standard. The other five were considered to be already covered by various legislative mechanisms. The two themes − and possible solutions − identified in the issues and options report are:

1. **gaps in the operation, maintenance and performance monitoring of systems** − the solution suggested was a warrant of fitness-type scheme requiring regular servicing, inspection and certification for the operation, maintenance and performance monitoring of on-site systems (referred to as a "programmed management scheme")
2. **inadequate training and education of designers, installers, regulators and maintenance personnel** − the solution suggested was to improve the qualification requirements for on-site wastewater system installers and other service providers.

The report concluded that securing long-term operation, maintenance and monitoring was vital to address many of the problems identified. The investigation highlighted a high level of support for the development of a national environmental standard for on-site wastewater management. In particular, local government and industry see benefits from a proposed standard in terms of :

- creating a level playing field for industry and clarifying environmental expectations
- providing consistency and certainty in decision-making and in the preparation of district/ regional plans
- providing a minimum level of protection for human health and the environment through a proactive framework.

A warrant of fitness-type scheme requiring on-site systems to pass a servicing inspection was considered particularly appropriate for a proposed standard. However, this support was tempered by general concerns about the cost of any additional monitoring required and the burden imposed on local government regulatory resources.

Based on these findings, the Ministry for the Environment concluded that regular inspections and maintenance would considerably improve the performance of on-site systems. Many councils have indicated they would like some national assistance in setting up an inspection and maintenance scheme in their areas, and a national environmental standard could provide a cost-effective framework for such regular inspections and maintenance. The benefits would include:

- improved education of system owners about their systems
- improved management of on-site systems
- improved performance of systems, resulting in reduced health and environmental effects
- improved longevity of systems.

In November 2006, the Ministry for the Environment convened a working group made up of local government officials, who provided background information and advice that has contributed to the development of the proposed standard (see Appendix 5 for a list of members). The Ministry for the Environment has developed an inspection framework for on-site wastewater systems (sections 5 and 6) and commissioned an initial economic appraisal of the proposed standard. The economic appraisal provides indicative costs and benefits for implementing the proposed standard, and the results of this appraisal are summarised in section 7.

1.2 Purpose

This discussion document has been prepared to:

- help you understand the proposal and its potential costs and benefits
- help you prepare questions and feedback
- guide you in making a submission.

1.3 What is a national environmental standard?

National environmental standards are regulations made under section 43 of the Resource Management Act 1991 (RMA) that prescribe technical environmental standards, methods or requirements.

National environmental standards may cover, but are not limited to:

- contaminants
- water quality, level or flow
- air and soil quality
- noise
- standards, methods or requirements for monitoring.

National environmental standards may specify qualitative or quantitative standards, standards for discharges, classification methods, methods and processes to implement standards, as well as exemptions and transitional provisions. They can apply nationwide or only to specific areas.

The regulation-making power under the RMA is limited. Sometimes it is impossible to address all areas of concern in a standard because only those matters that could reasonably be considered under the RMA can be included in a national environmental standard.

In the present context, a national environmental standard can provide local government with the tools to help manage or prevent risks to human health and reduce risks to the environment from the potential cumulative effects of multiple on-site systems. National environmental standards can capture wider benefits than is possible from decision-making at a regional or local level. Such benefits include providing a nationally consistent framework, providing more certainty, and simplifying the process of policy formulation, monitoring and review.

Each local or regional council must enforce the same standard, although it may impose stricter rules or bylaws if the national environmental standard explicitly allows for this.

1.4 The process of developing national environmental standards

An outline of the process for developing a national environmental standard, including the informal and formal submission processes, is shown in Figure 1. This discussion document forms part of the formal submission process.

The process of developing a national environmental standard differs from the statutory plan and resource consent processes in that there are no hearings, appeal provisions or First Schedule consultations. However, the RMA does require the Minister for the Environment to provide an opportunity for the public and iwi authorities to comment on the proposed subject matter of the standard before the national environmental standard is made. That opportunity is provided through submissions on this discussion document.

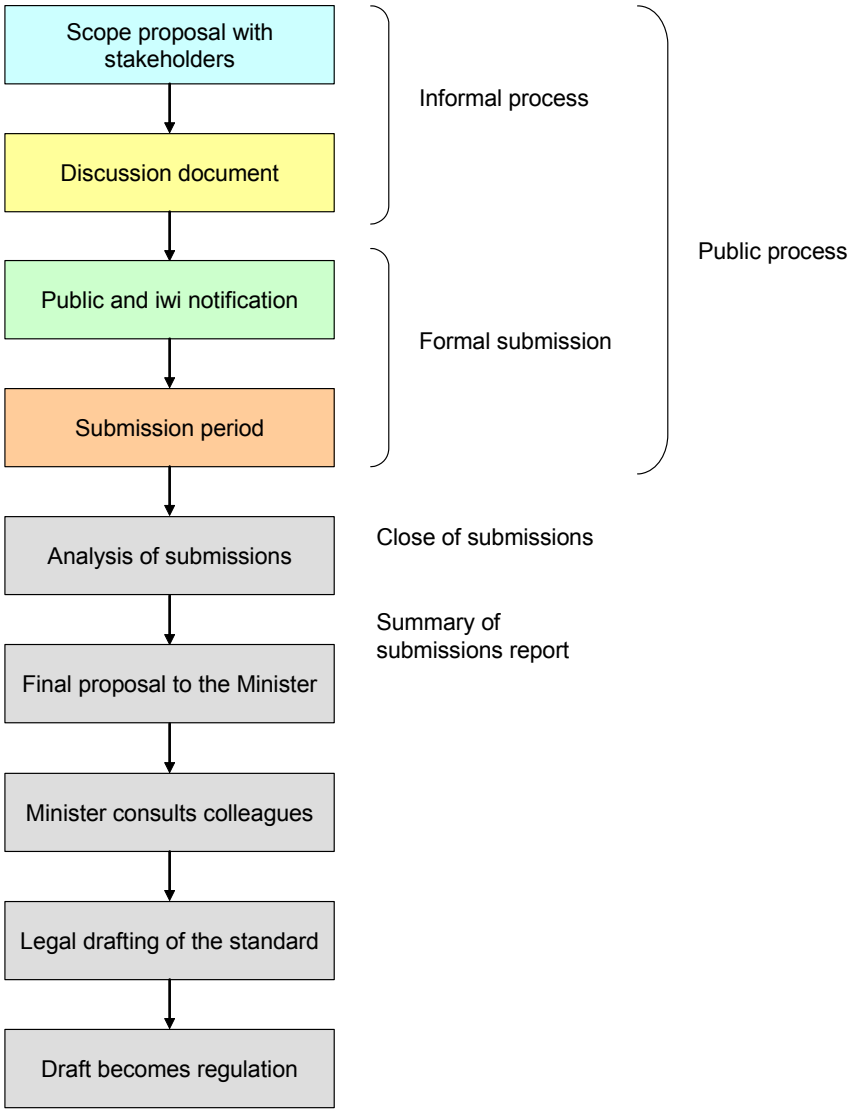
The submission period is your opportunity to make a formal submission on the proposed standard. A ten-week submission period is provided to enable any formal approval or ratification of submissions that is required by councils, committees or boards. Details on how to make a submission are given in section 8.

To help you formulate a submission, throughout the document questions are posed on aspects of the proposed standard for your consideration. These are listed at the end of each section and are brought together in section 8. However, you are welcome to provide feedback on any aspect of the proposed standard.

If the Government recommends a national environmental standard following consultation on this document, a regulatory impact assessment[3] will be required. This discussion document contains, and invites comment on, the substantive elements of a regulatory impact assessment.

At the end of the submissions process the Ministry for the Environment will prepare for the Minister for the Environment a report and recommendations on the comments and proposed subject matter of the standard and a formal evaluation of the alternatives, costs and benefits under section 32 of the RMA. The report and recommendations must be publicly notified. The Minister will then consider the report and recommendations and the section 32 evaluation before deciding whether to recommend to the Governor-General that the national environmental standard be made by order in council.

Figure 1: Process for developing a national environmental standard



[3] Regulatory Impact Assessment (RIA) is a policy tool widely used in OECD countries. RIA examines and measures the likely benefits, costs and effects of new or changed legislation and regulations. RIA is used to define problems and to ensure that government action is justified and appropriate.

1.5 Relationship to the proposed National Policy Statement on Freshwater Management

The Government has agreed to a strategy to improve the management of fresh water, protect our freshwater resources into the future, and acknowledge the fundamental importance of water to all New Zealanders. The strategy focuses on three national outcomes for fresh water:

- improve the quality and efficient use of fresh water by building and enhancing partnerships with local government, industry, Māori, science agencies and providers, and rural and urban communities
- improve the management of the undesirable effects of land use on water quality through increased national direction and partnerships with communities and resource users
- provide for growing demands on water resources and encourage efficient water management through increased national direction, working with local government to identify options for supporting and enhancing local decision-making, and developing best practice.

The proposed standard for on-site systems is strongly linked to the second outcome of improving the management of the undesirable effects of land use on water quality. The imminent development of a National Policy Statement for Freshwater Management will further provide high-level direction on the management of land uses to protect water quality and manage the increasing demands on quantity.

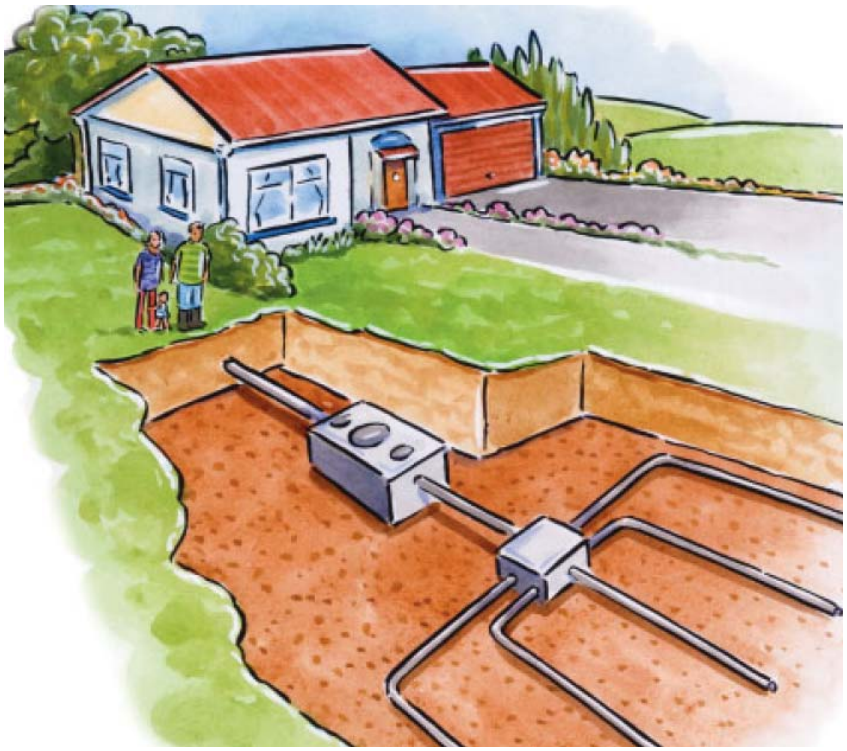
2 What are On-site Wastewater Treatment Systems?

On-site wastewater treatment systems (on-site systems) provide treatment of domestic wastewater and return it to the environment within the boundaries of the property of origin. There are many different types of on-site systems, and they are designed to treat household wastewater to varying levels before it is released back into the environment.

Septic tanks are a common example of a basic or 'primary' treatment system in New Zealand. Septic tanks have two components: a solids settling tank (which is, in fact, the septic tank) and an effluent disposal field, such as soakage trenches or subsurface drip irrigation. With primary treatment systems like septic tanks, the majority of the treatment of the wastewater actually occurs in the soil into which the wastewater is discharged, so it is important that the soils are not overloaded with wastewater.

Secondary and tertiary systems involve biological processes and further 'polishing' of the wastewater by using various techniques and equipment that help bacteria and other bugs to digest and break down the wastes in the wastewater before it is released into the environment. (For more detail, see Appendix 1: Definitions).

Figure 2: A primary treatment system, comprising a septic tank and a disposal field



Source: New Zealand Water and Wastes Association (NZWWA) and Ministry for the Environment, 2006.

3 What is the Problem?

3.1 Overview

Water quality in New Zealand is still comparatively good by international standards. However, there is evidence that quality is declining in areas that are dominated by agricultural and urban land use. Monitoring results from New Zealand's rivers over the past 15 years indicate a long-term trend towards increasing nutrient levels that are likely to have a negative impact on river ecosystems. Rivers and streams in urban and pastoral areas in particular have high levels of nutrient and faecal pollution. High levels of nitrates and bacteria in groundwater make water unsafe to drink and are particularly common in shallow, unconfined aquifers that are very vulnerable to pollution from land-use activities (Ministry for the Environment, 2007).

Although on-site wastewater systems are usually not seen as the main cause of pollution, they can and do contribute significantly to the deterioration in water quality in areas with sensitive environments or high densities of on-site systems. Apart from the environmental effects caused by the discharge of partially treated or untreated wastewater, failing on-site systems also pose a health risk to people through direct contact with untreated wastewater. This commonly results in gastro-intestinal upsets (enteric illnesses), but can also lead to more serious conditions caused by viruses and parasites. Children inadvertently playing in polluted areas are particularly at risk (see Figure 3 – note children's footprints and toys amongst the effluent).

Figure 3: A failed system with sewage effluent discharging onto a flower bed

Source: Photo courtesy of Far North District Council.

It is estimated that in some regions at least 20 per cent of homes rely on on-site systems to treat and dispose of their domestic wastewater. In Southland, for example, 61 of 80 settlements treat their wastewater using septic tanks. With the current trend of subdividing farmland into lifestyle blocks, the number of on-site systems is likely to increase.

Ageing septic tanks still represent the majority of on-site systems currently in use in New Zealand homes. However, regardless of whether it is a new home equipped with a high-tech system capable of treating wastewater to a very high standard, or an existing home with an old septic tank, all on-site systems require regular attention to ensure they function effectively. Ongoing maintenance backed up by regular inspections can play a significant role in improving the performance of wastewater systems. Unfortunately, research shows that many people don't understand or recognise the importance of managing and maintaining their on-site system, and some are not even aware their wastewater is treated by an on-site system.

3.2 Performance of on-site systems: the current picture

There are about 270,000 domestic on-site systems in New Zealand (including around 60,000 used for holiday homes). The performance of these systems is variable. Failure rates of on-site systems for different communities are estimated to range from 15 to 50 per cent, which equates to between 40,000 and 130,000 failing systems nationally (COVEC Ltd, 2007). The large amount of variability in these estimates is due to the variation in local factors, including, geology, climate, design and installation, lot size, and the age of the community.

An analysis of sanitary surveys[4] carried out by local authorities indicates an estimated 250 unsewered communities in New Zealand have problems with their on-site systems. Of these, slightly over half were identified as known or highly likely to be at risk of failure, with the remainder identified as suspected to be at risk. This equates to approximately 42,000 homes in unsewered communities with a failing on-site system. This number does not include isolated rural dwellings (EMS Ltd, 2007).

A selection of in-depth surveys by regional, district and city councils further highlights the overall bad performance of on-site systems.

- A survey of 3,251 systems in the Bay of Plenty found that 64 per cent of the systems surveyed failed an inspection (Graham and Futter, 2002).
- A survey around Lake Rotorua found that 77 per cent of septic tanks within the Rotokawa/Brunswick area did not comply with the Environment Bay of Plenty On-site Effluent Treatment Plan (1996). Ninety per cent of owners did not clean their on-site systems once per decade, contributing to the high nutrient load in Lake Rotorua. Water quality within streams and springs in the area showed high levels of faecal contamination.[5]
- Recent inspections of 2,000 properties on Waiheke Island (Auckland City Council) indicated that around 11 per cent had minor problems and a further 3 per cent had major problems.

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[4] Section 125 of the Local Government Act 2002 places a requirement on local authorities to carry out water and sanitary services assessment for their districts. As part of those assessments, the local authorities are required to assess the current state of wastewater treatment systems in communities not serviced by reticulated wastewater treatment systems.

[5] Rotorua Lakeside Community Sewerage Scheme Funding Proposal.

- An assessment of on-site systems in Clevedon Village, Manukau, found that approximately 20 per cent of on-site systems were subject to failure at the time of the inspection and a further 10 per cent were considered potentially likely to fail. The survey highlighted that educating residents on the operation and maintenance of their systems could improve the situation (Ormiston Associates Ltd, 2007).

3.3 How do on-site systems fail?

In general, 'failure' is defined as the situation where inadequately treated wastewater enters groundwater or surface water, creating an environmental risk, or rises to the ground surface, creating a risk to human health. This can occur through:

- inadequate management of the system (eg, disposing of unsuitable items or chemicals)
- inadequate maintenance of the system (eg, not pumping out the tank when required)
- the septic tank leaking directly into the ground through cracks in the tank walls and joints
- the on-site system being connected, either intentionally or by accident, to stormwater pipes or open stormwater drains, leading to overloading
- the pipes in the disposal field becoming blocked, causing concentrated wastewater to discharge into the ground
- the disposal field soil not being permeable enough, causing wastewater to rise to the ground surface (run-off to surface waters or discharge directly into groundwater through large cracks in the soil is possible)
- the disposal field soil being too permeable (eg, coarse sands or gravels), allowing the wastewater to enter groundwater without adequate treatment in the unsaturated soil (removal of contaminants such as pathogens is much more effective in unsaturated than saturated soils)
- the disposal field being too close to the groundwater table (in high groundwater situations), allowing the wastewater to enter the groundwater without adequate treatment (contaminated groundwater can then flow into surface waters, contaminating those surface waters)
- the system not having enough capacity for the size of the dwelling.

3.4 Main causes of failure

To operate effectively, on-site systems (including the disposal field) must be designed and installed correctly, and (with new systems) operated in accordance with the manufacturer's guidelines. The property owner or occupier plays an important role in managing what goes into their system and making sure the system receives regular servicing and maintenance as and when required. Regular servicing and maintenance are crucial to ensuring a system continues to effectively treat domestic wastewater.

In many cases a lack of ongoing servicing and regular maintenance is contributing to the high numbers of failing systems. The reasons for this are varied, but often it is simply that the property owner or occupier does not know how to manage and maintain their system. Some failures are due to poor installation, or the siting of systems in inappropriate locations (eg, areas with high ground water). Others may have just reached the end of their effective life span and need replacing. Appropriate management and regular maintenance can help identify problems early and reduce the need for costly repairs, with the added benefit of improving the lifespan of what is a very expensive part of an unsewered home.

Figure 4 shows an overflowing gully trap with sewage flowing onto the ground and under the house. This failure is directly attributable to lack of maintenance. The system was six years old and had not been adequately maintained. A pump-out of the treatment tank to remove accumulated solids immediately fixed the problem. Systems often require pump-outs at three- to five-year intervals.

Figure 4: An overflowing gully trap due to inadequate maintenance

Source: Photo courtesy of Environment Bay of Plenty.

3.5 Effects of failing on-site systems

The untreated or partially treated wastewater discharging from failing systems contains pathogens and nutrients that can be harmful to humans and the environment. These pathogens may include:

- bacteria such as *Escherichia coli* 0157 (*E. coli*), campylobacter, yersinia and shigella
- viruses such as norovirus and hepatitis A
- protozoa such as cryptosporidium and giardia.

Nutrients include:

- nitrates
- phosphorus
- sodium.

See Box 1 for further detail.

Box 1: Concentrations of bacteria and nutrients

Bacteria

E. coli is a bacterium that indicates the presence of faecal material in fresh water. This, in turn, indicates the presence of disease-causing (pathogenic) micro-organisms caused by discharges of treated human sewage (from wastewater plants, septic tanks or faulty sewerage systems) and dung from birds and animals.

A high concentration of *E. coli* indicates an increased risk of digestive and respiratory system diseases among people who come into contact with, or drink, the contaminated water. Very young children, the elderly, or people with impaired immune systems are particularly vulnerable to this risk. The health of livestock that drink contaminated water may also be affected.

Nutrients

Aquatic plants need many types of nutrients for growth, including nitrogen and phosphorus. This includes the dissolved forms of nitrogen (nitrate) and phosphorus (dissolved reactive phosphorus). However, increased levels of these nutrients in water bodies cause plant growth rates to increase excessively, especially if water flows, sunlight and temperature conditions are favourable. This can lead to algal blooms, as well as an over-abundance of aquatic weeds in river channels and on lake margins. Excessive algal or weed growth can reduce the recreational and aesthetic value of water bodies, and alter water quality (for example, by changing the acidity or oxygen levels).

Source: Ministry for the Environment, 2007.

Wastewater may accumulate on the ground, percolate into the groundwater or flow into nearby waterways. This poses public health risks and can cause damage to terrestrial and aquatic environments. The effects of untreated or partially treated effluent discharging to the environment can include:

- disease in people (especially young children) having direct contact with wastewater lying on the ground surface
- disease in people caused by drinking contaminated water (usually from shallow groundwater bores located near disposal fields)
- flies and mosquitoes breeding in ponded effluent
- methemoglobinaemia ('blue baby syndrome') caused by elevated nitrate concentrations in groundwater used for drinking-water
- disease in people (most often young children) from contact recreation (swimming and paddling) in contaminated stormwater drains, streams, lakes, estuaries and beaches
- disease in people caused by eating contaminated shellfish, either from private or commercial shellfish gathering (shellfish tend to concentrate the pathogens that occur in the water, making their consumption a higher risk than contact with the water itself)
- economic effects caused by having to close shellfish farms (even if no disease is actually caused)

- nuisance weed growth and/or algal blooms caused by elevated nutrient levels, which can have secondary effects on people and aquatic animals from algal toxin reactions
- deterioration of freshwater ecosystems due to reduced water quality
- permanent soil degradation caused by high levels of sodium and other salts from washing powders being disposed of through disposal fields.

Conservative estimates indicate that more than 100 streams and over 100 coastal sites are potentially being affected by effluent discharging from failing on-site systems (EMS Ltd, 2007). This is all contributing to the degradation of our water resources. The recent *Environment New Zealand 2007* report commented on the state of our surface water and groundwater resources (see Box 2).

Box 2: Effects on groundwater and surface water

Surface water

The median levels of nitrogen and phosphorus have increased in rivers within the national monitoring network over the past two decades. More specifically, over 1989–2003, there was an average annual increase in levels of total nitrogen and dissolved reactive phosphorus of 0.5 per cent to 1 per cent (Ministry for the Environment, 2006). While this increase may seem small, and is difficult to detect, it signals a long-term trend towards nutrient-enriched conditions that are likely to trigger undesirable changes to river ecosystems (Ministry for the Environment, 2007).

On a local level, for example, the Waiheke stream water quality has deteriorated in 11 out of 23 sites monitored by Auckland City Council with a median *E. coli* level exceeding the Ministry for the Environment and the Ministry of Health recreational guideline level (550 cfu/100 ml). Human activities have clearly accounted for the water contamination on the island and a proven relationship between on-site wastewater disposal and stream water pollution has been demonstrated for one location (Tang, 2007).

Groundwater

At a national scale, 61 per cent of groundwaters in New Zealand that are monitored have normal nitrate levels; the remainder have levels that are higher than the natural background levels, and 5 per cent have nitrate levels that make the water unsafe for infants to drink. Twenty per cent of monitored groundwater bodies have bacteria levels that make water unsafe to drink (Ministry for the Environment, 2007).

At a regional scale, increasing trends of nitrate are more widespread in some areas than others. Increasing nitrate concentrations have been reported in rural parts of Canterbury, probably due to the increasing intensity of human activities in the region, such as dairy farming and wastewater disposal (Environment Canterbury, 2002).

The impact of individual discharges from on-site systems on the environment is often small in comparison with other activities. However, when the individual contributions of multiple systems are combined, the cumulative effect can often be quite significant. Lake Taupo is a well-documented example (see Box 3).

Box 3: Effects on Lake Taupo

Scientific evidence gathered over the past 30 years shows the development and intensification of the rural and urban land around Lake Taupo has increased the amount of nitrogen entering the lake through groundwater, streams and rivers. This has contributed to a reduction in water quality caused by increased algal and phytoplankton growth in the lake. Although domestic wastewater discharges represent a relatively small proportion of the nitrogen entering the lake, discharges from lakeshore community wastewater treatment plants and concentrations of on-site systems can have disproportionate effects upon shallow near-shore waters.

Source: Environment Waikato (www.ew.govt.nz).

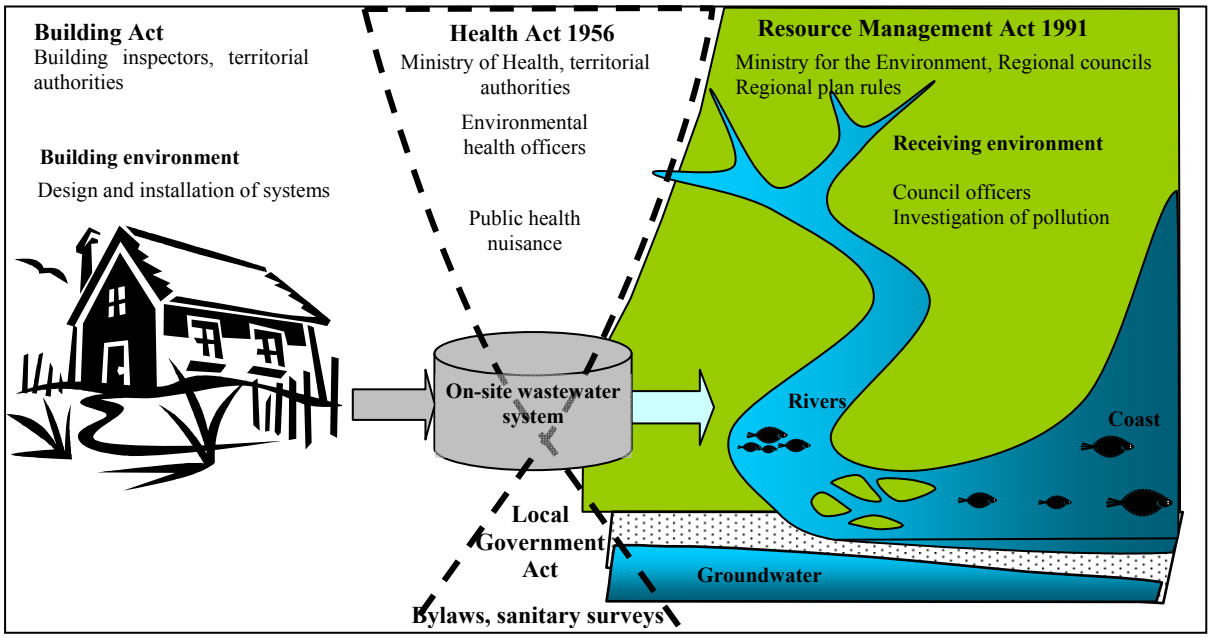
3.6 Existing controls for on-site systems

On-site systems are controlled by a number of pieces of legislation, including:

- the Building Act 2004 (through the Building Code)
- the Health Act 1956
- the Resource Management Act 1991 (RMA)
- Local Government Act 2002.

The Building Code has specific requirements covering the design and installation of on-site systems. In contrast, the Health Act has powers that can be invoked if an existing system is creating a nuisance or public health risk. The RMA controls the environmental effects of discharges from on-site systems.

Figure 5: Summary of the various controlling legislation for on-site wastewater management



Territorial local authorities exercise powers, duties and functions under the legislation shown on the left of Figure 5 (white area), and regional councils exercise powers, duties and functions under the legislation on the right (coloured areas).

In 2007, the Ministry for the Environment undertook a review of all regional plans and bylaws related to the consent status and maintenance provisions of on-site systems. The review found that the controls applied to on-site systems by local government vary. Some regional councils require resource consents and have comprehensive information for the public, while others permit all on-site systems through rules in their regional plans.[6] As a result, often a council may only become involved when serious problems have already occurred. The findings of the review are summarised in Tables 1 and 2 (for more detail, please refer to Appendix 2).

Table 1: Regional council consent status of domestic on-site systems in New Zealand (2007)

Permitted activity (existing and new systems)	**Existing systems permitted, new systems require consent**	**Primary systems require consent, secondary systems permitted**	**New systems located in sensitive areas require consent**
12 councils	3 councils	1 council	5 councils

Table 2: Local government management requirements for on-site systems

Council requirement	**Regional councils**	**Territorial authorities**
Regular pump-outs (compulsory)	2 (only for sensitive areas)	3 (through bylaws)
Systems maintained according to manufacturer's specifications (recommended)	2 (only for secondary systems)	
Systems maintained on a regular basis (recommended)	9	
No formal maintenance and inspections requirements (unless consented)	3	71

Only a handful of councils currently monitor the performance of on-site systems or have formal requirements for property owners to maintain their on-site systems. Councils are not able to directly recover the costs of monitoring permitted activities and have competing demands for limited financial resources for environmental monitoring. The result is that often councils simply don't have the ability to monitor activities such as discharges from on-site systems.

Environment Bay of Plenty (EBOP) is a regional council that does monitor the performance of on-site systems. EBOP's On-site Effluent Treatment Regional Plan evolved out of a need to reduce the well-documented impacts that domestic sewage discharged from on-site systems was having on the region's rivers, lakes and estuaries.

[6] Permitted activities do not require resource consent for the activity to legally occur, but may depend on certain conditions being met. For example, an on-site system may have to be located at least 25m from a stream. The discharge from an on-site system is subject to section 15 of the RMA, which is administered by regional councils and controlled through rules in regional plans.

Marlborough District Council's plan change 7: "On-site Discharges of Domestic Wastewater" to the Marlborough Sounds Resource Management Plan was in response to poor water quality attributable to on-site systems. On-site systems were having an adverse effect on the significant marine farming and tourism industries that rely on a high standard of water quality in the Marlborough Sounds. However, the Council acknowledges there are still challenges with addressing ongoing management of onsite systems:

> *The Council's ability to respond to poorly performing or failing systems under the Resource Management Act is limited to instances of non-compliance with permitted activity rules and resource consents.*[7]

Although communities may see on-site sewage treatment systems as a problem, they may have prioritised other issues in their regional plans and local bylaws. The Ministry for the Environment considers that, as a result of poor performance, a higher priority should be given to addressing the performance of on-site systems. To this extent, the current regulatory regime is failing to recognise the significance of the problem.

3.7 Case studies: regulating on-site systems in New Zealand

The following case studies illustrate different approaches to regulating on-site systems in New Zealand. The first illustrates the use of a bylaw (under the Local Government Act) to manage all aspects of on-site systems, from installation to operation and repair. The second example illustrates how regional plan rules have been developed to address contamination in sensitive environments.

3.7.1 Far North District Council bylaw[8]

The Far North District Council (FNDC) bylaw requires that all on-site systems be "installed, repaired, extended, operated and maintained, in a safe and sanitary manner, with no, or minimum adverse effects on the surrounding natural environment, or are a health nuisance, and in a manner that is culturally sensitive". FNDC conducted an on-site system survey at Okiato Point, which found that stormwater drains contained unacceptable concentrations of *E. coli* and faecal coliforms. As a result, FNDC initiated a programme of septic tank cleaning. After the cleaning, sampling showed a significant drop in the *E. coli* and faecal coliform count, which suggested that the previous high bacterial readings were partly due to the lack of maintenance of on-site systems.

Following the findings at Okiato Point, further surveys in other areas showed a similar pattern, with a lack of maintenance leading to some serious failures. In addition, another survey demonstrated that levels of maintenance were generally quite low, and that approximately 10 per cent of all surveyed systems posed a risk to the environment and the general public.

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[7] Plan Change 7 to the Marlborough Sounds Resource Management Plan.

[8] Source: Briefing Document, Far North District Council.

After assessing different options, FNDC decided the best alternative was to adopt a model bylaw, to ensure continual operation, adequate installation, maintenance and regular pump-outs of on-site systems. Given there are areas of socio-economic deprivation in the Far North, implementing a bylaw that puts the onus on property owners to pay to have their tanks cleaned out and serviced regularly was very challenging. FNDC worked in partnership with Housing New Zealand and Work and Income New Zealand to provide subsidy assistance, either to property owners who could not afford the pump-out maintenances fee or in circumstances where the system had failed and needed total replacement.

3.7.2 Rotorua Lakes – Environment Bay of Plenty[9]

Environment Bay of Plenty has regional plan rules in effect that are similar to what is proposed in the following sections. Lake-water quality has been monitored in the coastal area of the Bay of Plenty and Rotorua district lakes by Environment Bay of Plenty since 1990. For many decades Rotorua lakes have been under increasing pressure from human activities such as residential settlement and farming, and it was considered that wastewater from lakeside communities was a contributing factor. Investigations into septic tanks showed that Bay of Plenty had many households with old and basic septic tanks. In some areas septic tanks were failing, leading to contamination (high levels of pathogens and nutrients) of fresh and coastal waters. According to the study, lack of maintenance of septic tanks was a major reason for this pollution.

Environment Bay of Plenty developed the Operative On-site Effluent Treatment Regional Plan with the aim of reducing adverse environmental impacts. The plan created the On-site Wastewater Treatment and Disposal Inspection and Certification Programme to protect the quality of the environment while guaranteeing better management of septic tanks. Under the Certification Programme, Environment Bay of Plenty certifies septic tank inspectors, who can issue certificates of compliance for properly functioning septic tank systems. The plan also has rules to identify communities where the environmental effects of septic tanks are unacceptable, and requires a compulsory maintenance regime including pump-outs every three or six years (depending on whether or not an outlet solids filter is fitted) in identified communities serviced by septic tanks.

3.8 Case study: regulating on-site systems in New South Wales, Australia[10]

This example provides another approach to managing on-site systems. In 1998 the New South Wales Government introduced a package of local government regulatory reforms and guidelines to enable more effective council regulation and performance supervision of small domestic sewage management facilities. Councils are required to regulate the installation and operation of on-site sewage management systems. Regulations specify performance standards and require councils to supervise the operation of on-site sewage management systems.

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[9] Source: Environment Bay of Plenty (www.envbop.govt.nz/).

[10] Source: *Septic Safe*, NSW Department of Local Government.

All landowners with on-site sewage management systems are required to obtain an approval to operate from the council, and to maintain and manage their systems in accordance with health and environmental performance standards based on a risk assessment of the sensitivity of the environment, as follows.

- In high-risk areas the council may determine that septic systems require regular function checks to ensure they are working properly and that sewage pollution is not occurring.
- In medium-risk areas landowners may be asked to arrange regular function checks themselves and to report the results to the council from time to time.
- In lower-risk areas councils may provide long-term approvals or conditional exemption from approval, provided landowners keep systems well maintained.

3.9 Problem statements

The following problem statements summarise the issues that have given rise to the Proposed National Environmental Standard for On-site Wastewater Systems.

1. A large number of on-site systems in New Zealand are not performing in a way that provides acceptable levels of treatment of domestic wastewater.
2. Failing on-site systems are causing adverse effects on the environment and creating risks to human health by:
    - direct contact with overflowing or ponding effluent
    - leading to contamination of groundwater and surface-water supplies, which affects the quality of drinking-water supplies and may increase the occurrence of algal blooms
    - contributing to lakes, rivers, estuaries and beaches becoming unfit for swimming, gathering seafood and marine farming.
3. The current regime is failing to recognise or address the significance of the problem, and regional councils and territorial local authorities lack the tools to proactively seek to minimise adverse environmental and health effects from failing on-site systems.
4. Inadequate management, including a lack of ongoing servicing and regular maintenance, is a primary cause of the high number of failing systems in New Zealand.

Questions

1. Have the problems been defined correctly?
2. Are there other problems you can think of?
3. What is the magnitude of these problems?

4 What are the Options?

4.1 Policy objective

The objective of the proposed standard has been developed based on the issues identified in the preceding section:

> *To improve the management of on-site wastewater systems and to minimise the risk to people and the environment from the cumulative effects of malfunctioning or poorly maintained on-site systems.*

In particular, the objective aims proactively to:

- minimise health risks – by minimising contact with effluent as a result of malfunctioning or poorly maintained systems
- protect surface water and groundwater – by avoiding contamination of both surface water and groundwater resources caused by leaching or the direct flow of untreated or partly treated effluent caused by malfunctioning or poorly maintained systems
- prevent the degradation of land – by avoiding deterioration of soils or vegetation caused by contamination, salination, or erosion as a result of malfunctioning or poorly maintained systems
- protect amenity – by avoiding adverse impacts on amenity, including unpleasant odour, degraded aesthetics and the presence of pests as a result of malfunctioning or poorly maintained systems.

Underlying the policy objective is an assumption that the polluter pays principle should apply where on-site systems are having adverse effects on the environment.[11]

4.2 What are the options?

This section looks at the options that were considered and assesses their appropriateness for addressing the problems defined in section 3, and for achieving the policy objective set out under 4.1 (above). The options considered included:

- non-regulatory measures (eg, a partnership with regional councils and/or city/district councils to produce guidance or voluntary agreements)
- amend the RMA to require better management of on-site systems
- amend other legislation (eg, the Building Act, Health Act or Local Government Act)
- a national policy statement under the RMA
- a national environmental standard under the RMA.

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[11] 'Polluter pays' is one of 27 principles New Zealand committed to as a signatory of the 1992 United Nations Conference on Environment and Development (UNCED, or the "Earth Summit") multilateral environmental agreement.

Each option is assessed against a set of criteria that are derived from the policy objective above. These criteria are:

- improves the management of on-site systems
- proactively manages risks to health and the environment
- clarifies roles and enhances effectiveness
- reduces the number of failing on-site systems
- has local government input
- is cost effective
- applies the polluter-pays principle.

The following discussion of alternative options will help form the basis of the section 32 (cost-benefit) analysis if the consultation process indicates that a national environmental standard is the best means for achieving the objective. The status quo is not discussed in this section as it is outlined in the problem statement.

4.2.1 Reticulation

Section 3 identifies the management of existing on-site systems as a key problem. Reticulation could remedy this issue through the centralised management of wastewater treatment. However, if the issue is as simple as poor management of existing on-site systems, then reticulation may not be a cost-effective solution, especially where existing systems may still be in a functioning condition. A move to reticulation may also penalise on-site system owners who currently manage and maintain their systems appropriately. It would be contrary to the polluter pays principle to require homeowners with functioning systems to pay the cost of remedying problems they may not have contributed to.

However, there are situations where improving the management of existing on-site systems is not an option and reticulation is likely to be the only cost-effective and environmentally sound solution (eg, in areas with poorly draining soils, high water tables, and small lot sizes). In these cases the community and their council will need to work together to identify the most appropriate solution. This discussion document focuses on the potential benefits of improved management of existing on-site systems and does not consider options where reticulation is the only real solution. The remainder of this section considers various options for situations where improved management of on-site systems is likely to reduce the number and effects of failing systems.

4.2.2 Non-regulatory approach

Voluntary agreements

In this approach, the Ministry for the Environment could, through the use of voluntary measures, encourage and support regional councils, district councils, industry operators and property owners to improve the operation and maintenance of on-site systems. For example, the Taranaki Regional Council and the New Plymouth, Stratford and South Taranaki District Councils entered into an agreement[12] that clarifies the roles and responsibilities for the control and management of domestic wastewater systems. The Dairying and Clean Streams Accord[13] is another example of a voluntary agreement between different parties.

However, in the case of improving the operation and maintenance of on-site systems, the main parties are property owners, and it is unlikely that councils would want to draw up voluntary agreements with individual property owners. There would also be high costs involved in terms of the time and resources needed to develop the agreements. Finally, this option lacks any real incentive to comply, so there would still be uncertainty as to whether the process would lead to the improved management of on-site systems and, ultimately, better health and environmental outcomes.

Guidance and training

There is already a significant range of resources developed by central and local government to educate system owners in an effort to reduce the adverse effects from poorly operating or failing systems. These resources include:

- design and installation guidelines and requirements
- guidance on the operation and maintenance of on-site systems, including best practice guidelines on how to manage a system and avoid failures through correct operation and maintenance.

The information is readily available to system owners online and through pamphlets and booklets. This approach has already had some success, but based on the uptake of the currently available guidance material, further national or local guidance is unlikely to provide any additional or long-term benefit. It is unlikely that further guidance and training would, on its own, achieve the policy objective of improving the management or environmental performance of on-site systems or reduce the number of failing systems.

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[12] Taranaki Regional Council, New Plymouth District Council, Stratford District Council and South Taranaki District Council, *Looking After Your Household Sewerage System*, 2006.

[13] The Dairying and Clean Streams Accord is a voluntary agreement between the Minister of Agriculture, Minister for the Environment, Fonterra Co-operative Group and regional councils, which aims to achieve clean, healthy water, including streams, rivers, lakes, groundwater and wetlands, in dairying areas.

4.2.3 Using legislative changes

As we have seen, current legislation relating to on-site wastewater systems in New Zealand includes the Building Act 2004 (implemented by local authorities), the Health Act 1956, the Local Government Act 2002 and the RMA (implemented by district, city, unitary and regional councils).

The option of amending legislation to address the issue of failing on-site systems was considered. Current legislation addresses the design and installation of systems (the Building Act) or provides a mechanism to deal with any problems arising from the operation of on-site systems in a reactive manner (the Health Act). As a result, there is no continuity between the requirements of the various pieces of legislation as they relate to on-site systems.

Building Act 2004

The main purposes of the Building Act are to provide controls relating to building work and to set performance standards for buildings to ensure the health and safety of their occupants. The design and installation of an on-site wastewater system requires a building consent under the Building Act.

Territorial authorities are required to ensure that on-site wastewater systems are appropriately designed and installed, and will operate in such a way that no threat is posed to safety or public health. There is no mechanism under the Building Act to include a requirement in a building consent for ongoing monitoring or maintenance of on-site systems. Once a system is installed and a code compliance certificate is issued, the territorial authority has no further obligation for the on-site wastewater system. (In fact, some councils consider their responsibilities under the Building Act do not include on-site systems at all.)

A council is unable to recover directly any further costs associated with additional monitoring should it choose to do that. The effects of the discharge from on-site wastewater systems on the wider environment are not considered through the building consent process. There are powers in relation to unsanitary buildings, but these are only an option in the complete failure of an on-site system. The Building Act would require significant amendments to improve the ongoing management or environmental performance of on-site systems. Changing the Building Act to include addressing environmental effects would expand the purpose of that Act and also cut across the primary intent of the RMA. It is unlikely that the policy objective would be achieved efficiently and effectively through this option.

Health Act 1956

The Health Act 1956 supports the RMA in endeavouring to control adverse effects caused by the inadequate management of on-site wastewater systems. The RMA focuses on promoting the sustainable management of natural and physical resources, and the Health Act focuses on improving, promoting, and protecting public health, but both can work in tandem to address existing health problems.

Under the Health Act, territorial authorities have a duty to improve, promote and protect public health. Land occupiers and owners have a responsibility to comply with the Act, regulations and council bylaws that cover an activity. They are also liable for any 'nuisance' they cause, and this would include any on-site system that was considered to be in such a state that it was offensive or likely to be injurious to health (as defined in section 29).

The Health Act gives district and city councils powers to address problems with nuisances as they arise, and environmental health officers have powers to act where on-site wastewater management practices are having local or community health impacts. In practical terms, the Act gives territorial local authorities the power to require that actions are taken by a property owner to remedy a situation where a failing on-site system is creating a nuisance or risk to public health. Although councils are authorised to make bylaws for the protection of public health, the Act contains no other provisions for preventing nuisances arising, nor any mechanism to address the management of, or cumulative adverse effects from, multiple activities.

The Health Act would require significant amendments to provide a preventive or proactive mechanism for managing issues relating to the ongoing operation and maintenance of on-site systems. Amending the Health Act to include proactively managing the ongoing environmental (non-health) effects of on-site systems would be costly and not in keeping with the intent of the Health Act. The option of using the Health Act to achieve the policy objective has been discarded, as significant amendments to the Act would be required before any mechanism under the Act could be developed to achieve the policy objective.[14]

Local Government Act 2002

Under the Local Government Act 2002 (LGA), territorial authorities are responsible for the provision of water and sanitary services in their districts and are required to assess the provision of these services. The LGA also allows territorial authorities to make bylaws for the purpose of managing on-site systems. Under section 146(b)(iii) of the LGA bylaws can also be made by territorial authorities to manage, regulate against, or prevent the use of land associated with wastewater, drainage and sanitation. Bylaws can be used to enforce a requirement that is not covered by a rule in an (RMA) plan, and can be made to fulfil the purposes of the LGA, which is to provide for democratic and effective local government that recognises the diversity of New Zealand communities; and, to that end… provides for local authorities to… take a sustainable development approach. This is different from the purpose of the RMA, which is to promote the sustainable management of natural and physical resources.

However, despite the presence of model bylaws for the operation and/or maintenance of on-site systems produced by Standards New Zealand, they are not commonly used. Three territorial local authorities in New Zealand currently regulate the operation and/or maintenance of on-site systems through bylaws. For example, the Far North District Council and Waitakere City Council have put in place bylaws to tackle pollution and environmental health problems that are being caused by poorly managed on-site systems. The Waitakere City bylaw provides a regular pump-out and check of wastewater systems, with costs recovered through rates. The Far North bylaw provides for on-site wastewater disposal systems such as septic tanks to be assessed and

[14] Note: there is currently a major health reform Bill currently before Parliament. The Public Health Bill defines 'nuisance' as an activity or state of affairs that is or is likely to be injurious to public health or is offensive to persons in the area... The Bill, also takes an innovative "all-risks" approach to "detection, assessment and management of threats to public health." It is unlikely that the Bill's provisions will be wide enough to cover all environmental issues concerning on-site systems.

maintained on a three-year cycle as part of a registration and certification process. Tank cleaning and maintenance responsibilities remain with individual property owners, but the bylaw gives the council the power to enforce compliance.

These bylaws cover installation as well as maintenance, so they may not be considered necessary by local authorities given the existing Building Code requirements and the Health Act requirements and priorities. Furthermore, a bylaw cannot require a building to achieve performance criteria that are more restrictive, or are additional to, those specified in the Building Act or the Building Code, and this includes on-site systems (section 152 of the LGA 2002). Amendments to the Building Code would be required to allow for the proactive management of on-site systems.

In future, district council bylaws may slowly tend towards reducing the risk of adverse effects arising from failing on-site systems, but without any clear direction there is no guarantee this will occur. There is no power under the LGA to direct a local authority to make a bylaw for a specific purpose. It would presumably be possible to amend the LGA to require all councils to adopt a bylaw relating to the maintenance of septic tanks. However, such an approach would be inconsistent with the philosophical underpinnings of the LGA, which is basically enabling legislation that allows for − rather than requires − bylaws to meet the needs of communities.

This option was not considered appropriate because of the uncertainty in outcome of encouraging councils to introduce individual bylaws. While bylaws could provide an appropriate mechanism for achieving the objectives of improved management and environmental outcomes and for clarifying the roles of local government, the uncertainty over whether they would be introduced or adopted means it is unlikely this option would achieve the whole policy objective.

4.2.4 Resource Management Act 1991

The RMA is the only legislation that requires consideration of the wider effects on the environment, including effects on public health. Arguably, therefore, it is the most appropriate legislation under which to evaluate the operation and management of on-site wastewater systems. The RMA provides for matters of national significance to be addressed through the development of national policy statements and for regulations (e.g. for national environmental standards) for particular environmental issues.

National policy statement

A national policy statement (NPS) would require councils to change their plans and policy statements to give effect to its provisions. An NPS would leave the exact form, content and choice of technical methods to achieve the policy outcome to the discretion of individual regional councils. An NPS would likely lead to regulatory inconsistency between regions as to how individual councils interpret and incorporate NPS considerations into a plan.

An NPS would provide high-level direction on matters of national significance that enables the use of lower-level mechanisms such as national environmental standards to prescribe technical standards, methods or requirements. A proposed National Policy Statement for Freshwater Management is being scoped by the Ministry for the Environment and is seeking to provide context and objectives for freshwater management in New Zealand. This NPS seeks to include policies developed to improve the management of the undesirable effects of land use on water quality through increased national direction.

An NPS could, over time, achieve the objectives of improved management and health and environmental outcomes. However, it is not the most effective or direct method of achieving these objectives because of the high level nature and uncertainty of interpretation and implementation of such a policy statement.

National environmental standard

National environmental standards are more prescriptive instruments than national policy statements. The RMA enables the Minister for the Environment to prepare national environmental standards. These are regulations and are binding on local authorities. Section 43 of the RMA outlines the matters that can be covered. National environmental standards can prescribe technical standards, methods or requirements for achieving a policy objective, and can be either quantitative or qualitative. There is considerable flexibility around what and how things can be considered or required. The Ministry for the Environment is currently developing or investigating the possibility of a series of national environmental standards to meet the outcomes of the Government-agreed strategy to improve the management of fresh water, including a:

- National Environmental Standard for Sources of Human Drinking-water (now in force)
- National Environmental Standard for Measurement of Water Takes (currently being drafted into regulation)
- proposed National Environmental Standard on Ecological Flows and Water Levels (under consultation).

A national environmental standard is appropriate for improving the management and environmental performance of on-site systems. As we have seen, a number of case studies have shown that lack of maintenance of on-site systems is the primary cause of inappropriate discharges from systems contributing to the contamination of waterways, groundwater and, in some cases, drinking-water. The majority of on-site systems in New Zealand are regulated by permitted activity rules under regional and district plans. Only two regional councils and three territorial authorities require regular maintenance of on-site systems through rules in plans or local bylaws. The Ministry for the Environment considers that it would not be efficient to expect each individual council to implement new rules in their plans or introduce new bylaws to address the problem. Instead, a national environmental standard would be a more efficient and cost-effective tool to improve the management of on-site systems and reduce the adverse effects that result from malfunctioning or poorly maintained on-site systems.

The opportunity to promote compliance with the Australia / New Zealand standard for on-site systems (AS/NZS 1547:2000) through a national environmental system was considered. However, many councils have chosen to use either Auckland Regional Council's *On-site Wastewater Systems: Design and Management Manual* (TP58), or AS/NZS 1547, or a combination of both. These requirements have in many cases been written into regional and district plans, so it would be inappropriate to require compliance with just AS/NZS 1547:2000.

4.2.5 The preferred option

Having considered the available alternatives, a **national environmental standard** is considered the most appropriate means of achieving the policy objective. In this case, regulations are considered more effective for achieving the desired outcome than guidelines or voluntary agreements. In addition, a standard is considered a more appropriate instrument than an NPS because it can be more prescriptive. A national environmental standard meets the policy objective of improving the management of on-site systems more effectively and efficiently than the other available options.

An inspection regime was identified through the initial issues and options work as the most appropriate way to address ongoing failures of on-site systems. The management and maintenance of on-site systems is critical to their effectiveness, but at present there is no general mechanism to ensure this important aspect of on-site wastewater management is carried out.

Further in-depth consideration of the options presented here is contained in the document *Issues and Options for the Management of On-Site Wastewater Systems in New Zealand* (Duffill Watts & King Ltd et al, 2005), available on request from the Ministry for the Environment.

Table 3: Comparison of the different options in terms of their effectiveness in achieving the desired outcomes stated in the policy objective

Criteria	Alternative options that did not satisfy the selection criteria				Preferred option
	Status quo	Non-regulatory measures	Legislative change	National policy statement	National environmental standard
Improves the management of on-site systems	×	~	~	~	✓
Proactively manages risks to health and the environment	~	~	~	~	✓
Clarifies roles and enhances effectiveness	×	×	✓	✓	✓
Reduces the number of failing on-site systems	×	~	✓	~	✓
Has local government input	✓	✓	×	~	✓
Is cost effective	×	~	×	~	~
Applies the polluter pays principle	×	×	✓	~	✓

Key to table:

✓ Meets the criterion × Does not meet the criterion ~ Partly meets the criterion

The main benefits of using a national environmental standard over other options are that it would:

- fulfil the policy objective by providing a framework for proactively managing the risks to human health and the environment from on-site systems
- provide mandatory requirements to achieve the policy objective
- allow for more prescriptive requirements than legislative amendments, and so would be less open to interpretation, and provide more direction and certainty to councils and the public

- be able to be more readily and quickly amended than legislation or plans if later changes are required
- remove any ambiguity over who is responsible for managing failing on-site systems
- provide consistency across all local government jurisdictions on the method of undertaking the inspections and what constitutes a failed on-site system
- give effect to the intent of the Proposed National Policy Statement on Freshwater management and meet the policy objectives of the proposed NPS of enabling the well-being of people and communities, improving the quality of fresh water, addressing freshwater degradation and ensuring effective monitoring and reporting
- be more cost-effective than alterations to legislation or plans.

Questions

4. Do you agree with the policy objective?
5. Is there an alternative approach that has not been considered?
6. Do you agree with the analysis provided in this section?

5 The Proposed Standard

5.1 A 'warrant of fitness' for on-site systems

A national environmental standard is a legally enforceable regulation. The exact wording of this standard will be drafted if the Minister decides to proceed, following this consultation. In essence, the standard will have as its purpose:

> *[From 1 July 2010] Owners of properties with on-site wastewater systems in locations identified by the regional council will be required to hold a current warrant of fitness (WOF) that confirms their on-site system is functioning properly and is being maintained to an appropriate standard.*

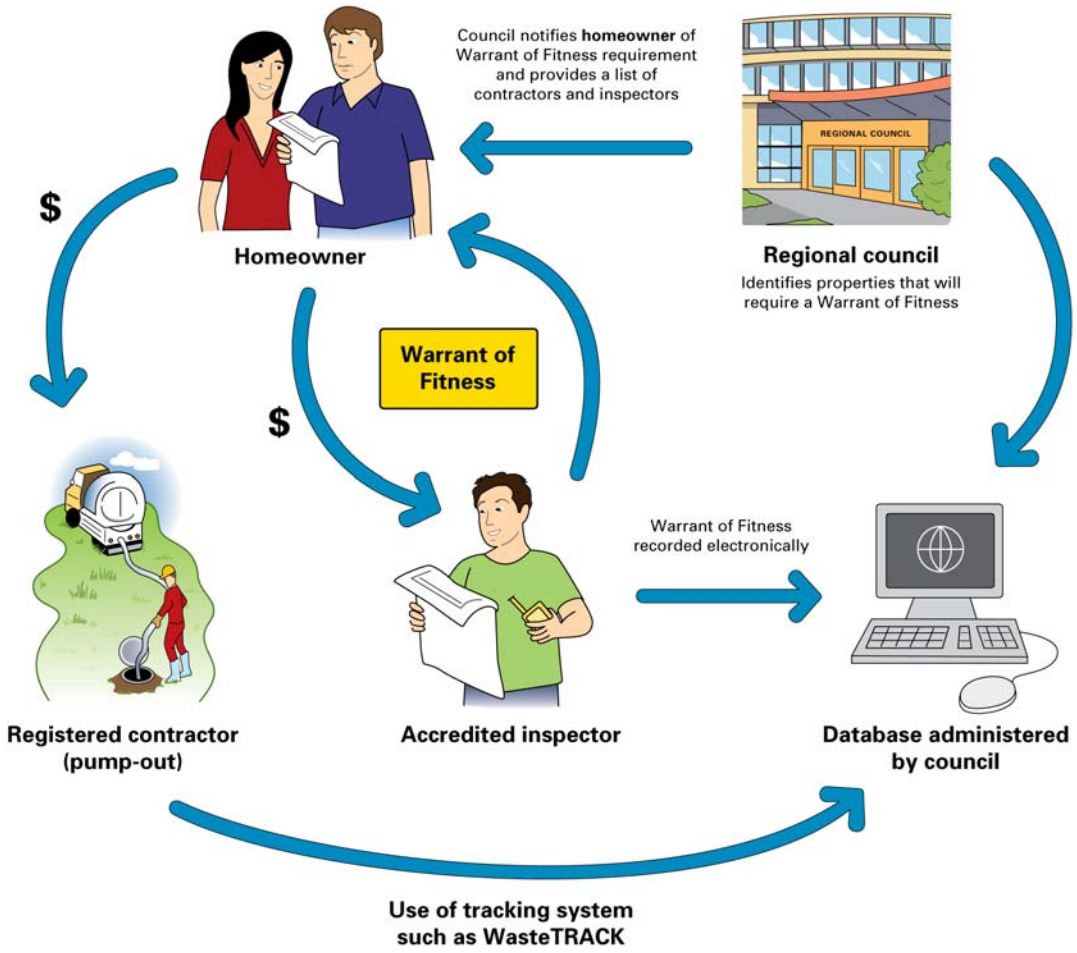
The proposed standard would apply only to domestic on-site systems that are operated as permitted activities under rules in a regional plan. It would *not* include on-site systems servicing businesses, schools, marae, camping grounds, etc. It is assumed that those premises are already monitored by councils under current resource consents. However, your views are sought on whether the proposed standard should cover consented systems or non-domestic on-site systems.

Regional/unitary councils would administer the proposed standard. Each council would be required to undertake an assessment to determine where the proposed standard would apply. The regional council may have to work in conjunction with territorial authorities to gather some of the necessary information. Regional/unitary councils would administer a database of relevant information on the on-site systems, including the outcomes of the regular inspections. They would also be responsible for any follow-up or enforcement action. Regional councils, in agreement with territorial authorities, may transfer their powers to territorial authorities through section 33 of the RMA.

System owners would have the responsibility of ensuring they hold a current warrant of fitness (WOF). They will be responsible for organising and paying for inspections (unless a council chooses to organise the inspections themselves). System owners will also continue to be responsible for the ongoing management and maintenance of their on-site systems. System owners will cover the cost of the WOF inspection as well as continuing to cover the cost of ongoing operation, maintenance and repairs.

Inspectors will be responsible for inspecting on-site systems in accordance with defined criteria on an inspection checklist and accompanying manual. The inspector will issue a WOF where an on-site system passes an inspection (similar to an inspector at a vehicle testing station). The inspector will also be responsible for identifying problems that need remedying to pass a WOF. A fee would be charged for carrying out an inspection.

Figure 6: How the proposed national environmental standard would operate



The WOF system could operate in much the same way a vehicle WOF operates.

- A WOF would relate to a specific on-site system, and would be issued to the property owner.
- A WOF would have an expiry date.
- The owner would have the responsibility for ensuring the system is operated and maintained appropriately throughout the period of the current WOF.
- A system would need to be re-inspected if any modifications to the system or dwelling (eg, additional rooms) occurred.
- The WOF check would be underpinned by an inspector's manual that includes assessment criteria for what constitutes a pass or a fail for each item that requires checking (similar to Land Transport New Zealand's *Vehicle Inspection Requirements Manual*).
- A recognised training course on inspecting on-site systems would be developed for inspectors, similar to that used with inspectors for vehicle WOFs.

To obtain a WOF, an on-site system would first have to pass an inspection check. To pass an inspection, the system would have to achieve a pass for each critical component of a checklist (see Appendix 7). If, during the inspection, only minor maintenance problems were identified (eg, a tank inspection lid was not properly sealed), then a WOF could be issued with recommendations attached. The responsibility for ensuring the ongoing maintenance of a system would remain with the property owner.

A WOF would be valid for three years, with a requirement to be re-inspected on or before the expiry date of the current WOF.

5.1.1 Inspection

The purpose of the inspection would be to check compliance of an on-site system against the main components of an inspection checklist. The inspection checklist would consider the physical condition of a system and look for any problems with the functioning of the system. The person carrying out the inspection would provide the system owner with the results of the inspection (ie, a copy of the checklist). Possible WOF outcomes would be:

- *pass*
- *pass* with conditions or minor remedial works required
- *fail* with substantial remedial works required before re-inspection
- *fail* where remediation is not viable and off-site options need to be investigated.

A timeframe for re-inspection would also be supplied.

Regular inspections would:

- identify on-site systems with critical problems or failures
- help to identify or confirm the causes of problems that may be affecting the household, the environment or the community, and what can be done to fix them
- provide for pump-out based on need, ensuring adequate maintenance is carried out, while avoiding fixed-interval pump-outs that can generate excessive volumes of dilute septage and adversely affect the functioning of a system.

The following key pass/fail criteria will be critical for obtaining a WOF for an on-site system.

1 Observation, or evidence, of the discharge of wastewater to the ground surface from any component of an on-site wastewater management system

The discharge may be from drainage pipework, treatment units, land application fields or other sources. This kind of failure creates a direct risk to human health and may allow the discharge of pollutants off-site into neighbouring properties, drains and waterways. Note that the unacceptable discharge of pollutants to groundwater from an on-site system has not been included in these criteria. It is very difficult, and often cost prohibitive, to accurately determine the quantity of pollutants entering groundwater from an individual on-site system. Defining a system as failing due to groundwater contamination is difficult, and the responsibility for developing solutions is often spread among stakeholders rather than focused on the system owner.

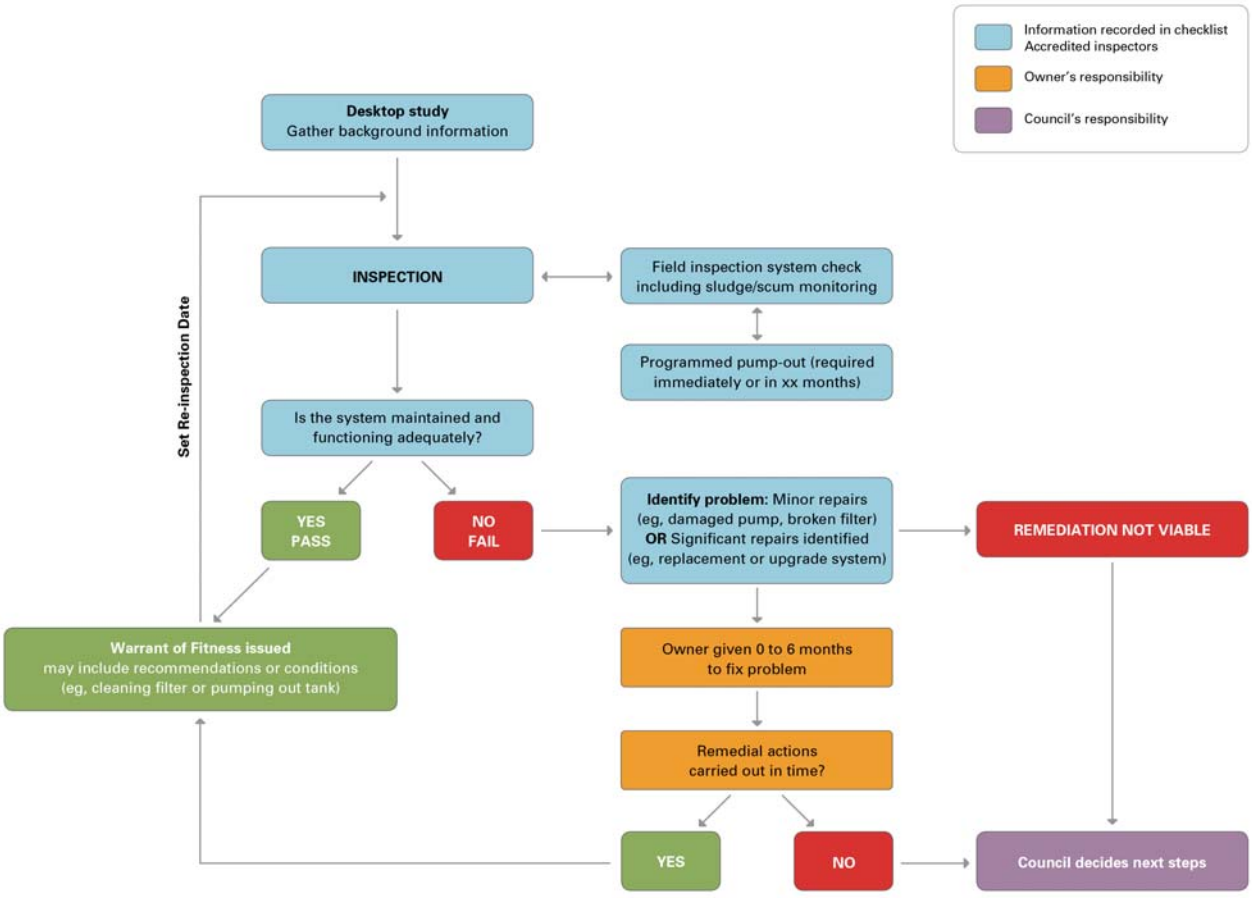
2 Gross failure of wastewater treatment and/or conveyance processes

This may include an observed lack of biological activity (and accompanying poor effluent quality and odour), excess accumulation of sludge and scum, or inappropriate dosing rates to a downstream component. Failure of this kind is highly likely to lead to long-term failure of the system to protect public health and the environment.

3 Failure or breakdown of physical system components

This may range from cracked drainage pipework (which also triggers the first criterion), a cracked tank lid, blocked dosing pipework or a trench physically damaged by vehicular traffic. A more detailed checklist will be developed for inspectors in the field to ensure consistency across regions and certainty for making pass and fail decisions.

Figure 7: How the warrant of fitness is issued by means of inspection



An on-site system may receive a conditional pass if an immediate pump-out is necessary or minor repairs are required (eg, a vent is broken and needs repair). The WOF will then be issued upon evidence that the pump-out or minor repairs have been completed (this could be a WasteTRACK entry or a receipt from the waste contractor indicating a pump-out has occurred, see Appendix 4). This means a follow-up inspection would only be required if it was deemed necessary.

If an on-site system fails an inspection, the system owner will be notified of the failure and the reason(s) for it, as identified by the inspector. A failure could be the result of a simple lack of maintenance that requires only minor attention, such as a clogged outlet filter that needs servicing for the system to be operating effectively. A failure may also occur because of more significant problems that may require repairs or replacement to part or all of a system.

If a system fails an inspection, the owner will be given a certain time period, depending on the nature of the failure, to remedy the problem and obtain a WOF. The timeframe for fixing problems will depend on the severity of the problem and the environmental effects the failure is causing (see Table 4 below). If the system is causing severe pollution or poses a significant health risk, the property owner may also face other actions by the regional council under the RMA (such as an abatement notice, enforcement order or prosecution). The system owner will have to show the failures have been remedied to be issued with a WOF. The system would not necessarily require a complete re-inspection − the focus would be on the elements that failed the initial inspection.

If, after the agreed time period, the owner has not remedied the deficiencies and obtained a current WOF, he or she will be in a position of non-compliance. The regional council would then decide how to address the non-compliance. In other words, the situation would default to the existing enforcement regime under the RMA. (If an on-site system is in non-compliance, it is likely that it will also be in breach of a permitted activity rule for the region.)

5.1.2 Enforcement

The proposed standard would be enforced by regional councils. The legal process for non-compliance with a national environmental standard would be to issue an abatement notice under section 322(1)(a)(i) of the RMA or apply for an enforcement order under section 314(1)(a) of the RMA. Prosecution by the council for continued non-compliance with the abatement notice or enforcement order could be a last resort. For example, councils could issue an abatement notice for failure to comply with the requirements of the standard, which could include additional time that may be needed by a property owner to remedy a problem. On the other hand, where an area is scheduled to be connected to a reticulated treatment system in the near future, requiring costly repairs may not be appropriate, so councils need to be able to exercise their discretion.

The specification of a time period within which remedial action is to be carried out would prevent a system owner becoming immediately exposed to enforcement action if their system did not pass the initial inspection. This approach provides flexibility for situations where, for example, a local council is considering reticulation for a community, or where a property owner may not be financially able to address a problem within six months.

Table 4: Examples of possible deadlines to fix problems

Nature of system failure	Deadline for fixing problem
Ponding of effluent and or effluent entering a waterway	Immediately (within 30 days)
Treatment unit scum/sludge capacity full and requires immediate pump-out	Immediately (within 30 days)
Land application system failing and requires remediation or replacement	2 to 4 months
Treatment unit and/or land application system has insufficient capacity to cope with inflows and requires upgrade or replacement	Due to costs, up to six months

5.2 Why target only specific areas?

The option of applying a national environmental standard to every property in New Zealand with an on-site system was considered. However, this option has been discarded because an initial cost−benefit assessment indicated that the costs would significantly outweigh any potential benefits. Applying a standard to 'everyone – everywhere' would put significant pressure on local government and other resources, and it is considered more effective to focus resources on high-priority areas.

It is important here to note the significance of cumulative effects. Although the periodic release of insufficiently treated wastewater (containing nutrients and pathogens) from a single on-site system may pose a health risk to people living in the household, it may not adversely affect the environment or lead to off-site effects. Natural processes such as absorption, assimilation, filtration and die-off of organisms may render the impact of a discharge undetectable. However, when the influence of a number of systems is combined, the cumulative risks to human health and the cumulative effects on the environment can be significant. This is why a refinement of the initial proposal has been developed that would target a national environmental standard, focusing on areas that have known problems with the performance of on-site systems or where there is an actual or potential risk to the environment from on-site systems. This focus is thus on areas where there would be the greatest benefit.

5.3 What the proposed national environmental standard does not cover

The proposed standard does *not* cover:

- the qualification of inspectors – this would be developed separately and sit outside the standard
- cluster systems or decentralised systems – these generally require resource consents, with their own monitoring conditions attached
- hotels, motels, camping grounds, restaurants, schools and marae – these generally require resource consents with their own monitoring conditions attached
- design of on-site systems – this is covered through the Building Act and guidelines (AS/NZS 1547:2000 and 1546 suite of standards; TP58)
- installation of on-site systems – this is covered through the Building Act
- maintenance contracts or servicing – service agents check the internal components, but do not always check the public health and environmental impacts of effluent disposal
- certification/accreditation of on-site systems – SWANS-SIG[15] proposes to act as the national auditing and information storage body (there is a trial site for this in Rotorua)
- decisions on when a community should move to reticulation
- educating property owners about how to operate on-site systems – most councils already have very good educational material.

[15] Small Wastewater and Natural Systems Special Interest Group.

Questions

7. Do you have any general comments about the proposed standard for the inspection and maintenance of on-site wastewater systems?
8. Should the proposed standard apply to private dwellings only, or should it apply to all on-site systems (including consented systems) that treat domestic wastewater, including hotels, motels, camping grounds, restaurants, schools and marae?
9. Do you agree with the inspection interval of three years?
10. Should inspections be coupled with an immediate pump-out?
11. Do you agree with the proposed critical components for the checklist (see Appendix 7)?
12. Should the proposed standard prescribe a minimum level of treatment (eg, secondary) for new on-site systems? (Note: This could have the effect of banning the installation of new septic tanks in favour of treatment systems that provide greater levels of treatment.)

6 Implementing the Proposed Standard

6.1 How will the proposed standard be implemented?

The default position would place responsibility on regional councils to administer the proposed standard, although functions could be transferred to territorial authorities under section 33 of the RMA. The following steps outline how the proposed standard could be implemented.

Step 1. Regional councils identify the areas where the national environmental standard would apply. To do this they may:

- undertake a broad-scale risk assessment of their region that considers a range of factors (see Appendix 3 for more information on what needs to be considered)
- consult with stakeholders within their short-listed areas to make an informed decision on where the proposed standard should and should not apply.

Step 2. The specific areas are gazetted by the Minister for the Environment.

Step 3. Regional councils notify the system owners that they are required to obtain a current warrant of fitness for their on-site system.

Step 4. The system owner arranges for an inspection. Alternatively, the council may choose to schedule the inspection themselves to make efficient use of resources in one area and ensure any outstanding background information on the on-site system is being captured.

Step 5. The inspector carries out an inspection and notifies the owner and the council of the outcome. If a system passes an inspection, the inspector issues the system owner with a warrant of fitness (WOF). The WOF may include recommendations for minor maintenance of the on-site system or formal conditions. If a system fails an inspection, the inspector notifies the owner, gives the reasons for the failure and informs the owner of the actions required to remedy the failure and the time period for doing so.

It will be the system owner's responsibility to arrange for any problems to be fixed. Once the problems have been fixed, the system owner will contact the inspector to confirm this and a WOF can be issued. This may or may not require an additional inspection, depending on the nature of the remedial action.

6.2 Where will the proposed standard be applied?

The standard would apply to specific areas defined by regional councils and gazetted in the New Zealand *Gazette*. It would *not* apply across the entire country, as analysis indicates this approach would be excessively costly and unnecessary where on-site systems don't cause off-site problems (see Section 7 on cost−benefit analysis). The specific areas to be gazetted would be where there are known problems with on-site systems (hotspots), or environments that are at risk of degradation from an increase in on-site systems if they are not maintained properly, such as locations:

- with high numbers of failing systems
- where there is a high risk of environmental degradation or damage from failing systems
- that have sensitive receiving environments
- where the cumulative effects of large numbers of on-site systems degrade the environment, or where there is the potential to do so.

The identification of areas where the proposed standard is to apply would be left to councils. A risk-based approach would give councils the flexibility to apply the standard where it would have the greatest benefit, based on environmental consequences and local priorities. It also provides more effective use of the resources needed to implement WOF inspections in the targeted areas.

Appendix 3 contains various parameters that could be included in a risk assessment as a guide to help councils identify specific areas where the proposed standard could be applied. These specific areas or parts of a region will then be formalised by the Minister for the Environment by notice in the *Gazette*. The process of gazetting will be same as that used for the National Environmental Standard for Air Quality. Councils will have the option to expand the monitoring of on-site systems across the entire district or region if they wish. For example, they may decide to target the most urgent areas first, and then include the remaining areas later to spread costs and resources.

Nearly all the councils spoken to during the development of the issues and options report were able to define areas in their districts or regions where a large proportion of on-site systems are failing (Duffill Watts & King Ltd et al, 2005). A number of these areas are older settlements with ageing systems and small sites, or coastal properties where extensive development is occurring. Next to lack of maintenance high groundwater and poor soils were the most common issues, and it appears that often the system design did not consider these physical environmental constraints.

There are two distinct types of areas that may be identified through a targeted or risk-based approach: hotspots and sensitive areas.

Hotspots are areas with existing problems. A hotspot area could be a community with high numbers of failing systems, or where the cumulative effects of on-site systems are having adverse effects on:

- water quality, through bacterial or nutrient contamination
- amenity, through unpleasant odour or pests
- public health, through surface discharges of untreated or partially treated effluent.

Generally, the drivers for identifying hotspots are concerns around public health or poor water quality. Information may be available through sanitary surveys or complaints, and knowledge of hotspots may be held by either territorial authorities or regional councils. Regional council water-quality monitoring data may also help identify hotspots.

Sensitive areas are where the presence of on-site systems could create an environmental risk. The risk may be the actual or potential (cumulative) adverse effects on water or soils, including those created by current or future development. Sensitive areas would be identified by analysing local environmental conditions to identify areas of potential risk. This is primarily a regional council exercise.

6.3 How will the proposed standard be administered?

Administration of the information gathered under the proposed standard will be important. A database that can track the status of individual systems will be an essential monitoring tool for councils. Ideally, utilising an existing database would be the most effective and efficient option. The Ministry for the Environment is looking at providing a model solution that could be adopted by councils if they choose to, such as the WasteTRACK model that is currently used for tracking liquid waste (see Box 4).

Box 4: WasteTRACK

WasteTRACK is a Ministry for the Environment-supported tracking system that is used to track the movement and disposal of liquid wastes, including domestic septage. The system is an internet-based database with varying levels of access, which allows waste contractors (or potential inspectors) to enter data, and regulatory authorities to view and administer data. Use of WasteTRACK is already a requirement of some councils for transporting liquid wastes, and it provides a model that can be developed for the WOF scheme.

The following web address gives a summary of the WasteTRACK system as it applies to carrying wastes: www.wastetrack.co.nz/

6.4 Who will carry out the inspections?

For the proposed standard to operate effectively there needs to be an adequate pool of suitably skilled (or qualified) inspectors. An inspector will be a competent person, as judged through an industry standard qualification or an accreditation-type process. This will ensure inspectors are accountable and carry out their duties consistently. If the proposed standard proceeds, the Ministry for the Environment will help develop training material for a suitable unit standard-type qualification. The qualification would be supported by a standard checklist and inspector's manual to refer to when carrying out the inspections, to provide a consistent level of competency for inspectors.

The mechanics of just how the inspectors would be involved in the national environmental standard process have been purposely left open to allow flexibility for councils in terms of how they choose to approach this. Having an independent qualification provides consistency as well as flexibility as to who can carry out inspections.

Council officers could become qualified, which would mean the whole process is managed and operated by the council, or the inspectors could be anyone who chooses to become qualified to undertake the work (eg, 'sucker truck' operators, drain layers). However, there is an issue of whether there would be enough people willing, able and qualified to conduct inspections, which in turn could affect competition and the cost of inspections. Adopting this approach would therefore require adequate lead-in time to ensure there were sufficient qualified inspectors.

6.5 When will the proposed standard be implemented?

The proposed standard would provide for a phased implementation of the WOF inspection in each region according to site-specific factors and specified timelines. A deadline for councils to identify targeted areas for gazetting could be **12 months** after the regulations come into force. A timeframe for all systems within targeted areas to be inspected (or hold a WOF) from commencement of standard could be **three years**.

Questions

13. Should the proposed standard apply to targeted areas as proposed, or across the whole of New Zealand?
14. Do you agree with the risk assessment methodology and the proposed criteria for identifying targeted areas?
15. Do you see any problems with the implementation and administration of the proposed standard?
16. What would be an appropriate training level for inspectors/certifiers? Is a unit standard qualification for inspectors an appropriate method for ensuring consistency of inspectors?

7 Costs and Benefits of the Proposed Standard

A preliminary assessment of the costs and benefits of the proposed national environmental standard has been undertaken. The complete analysis will be reported in two parts: an initial scoping assessment, presented in summary here, followed by a fuller quantification after an analysis of the consultation responses and formulation of a final position on the proposed standard.

7.1 Introduction

This section identifies the costs and benefits that would be likely to arise from the Proposed National Environmental Standard for On-site Wastewater Systems. The cost−benefit analysis completed as part of the development process initially considered two options for establishing a WOF-style inspection scheme:

- require all domestic systems to be inspected
- require the inspection of systems located in specific, targeted areas (ie, hotspots and/or sensitive areas).

The initial assessment of the costs and benefits of applying a national environmental standard to every property with an on-site system indicated the costs would far outweigh any potential benefits of such a regime. The costs of applying the proposed standard to 'everyone everywhere' are approximately six times higher than the 'targeted area' approach, but only provide approximately three times the benefit (see Table 5.)

As a result, this discussion document only considers the targeted application of a proposed standard to areas or locations that have existing problems, or where there is likely to be a risk to the environment from existing or new on-site systems. One key point to note is that it has not been possible to quantify the potential environmental benefits of improving the performance of on-site systems. Note also that the costs and benefits are only summarised here: further in-depth analysis of the costs and benefits (COVEC Ltd 2007) is available on request.

Table 5: Preliminary evaluation of options for applying the proposed standard (approximate estimates)

Option	Systems affected (estimated)	Average annual total costs ($ million)	Potential annual public health benefits ($ million)	Annual environmental benefits	Benefit:cost ratio (excluding environmental benefits)
Targeted application of NES	42,000	$3.4–$5.2	$0.75–$3	Unquantified ✓✓	0.20–0.52
Everyone everywhere (DISCARDED)	255,000	$21–$31	$1.5–$6	Unquantified ✓✓✓	0.064–0.17

7.1.1 Limitations

Most of the costs can be estimated with a reasonable degree of certainty, but many of the benefits cannot be quantified. For example, there are environmental benefits from reducing the discharge of untreated or partially treated wastewater to the environment, but attributing a monetary value to these is difficult. Also, the effects from discharges are often the result of multiple activities, of which discharges from on-site systems are only one contributing factor along with agriculture, discharges from boats, wildlife, etc.

For public health effects, a paucity of data also makes quantification difficult. Estimates are based on opinions given by a number of organisations and technical experts, and provide order-of-magnitude estimates of the public health benefits. Some impacts − including environmental benefits − are outlined but not quantified. A small number of councils currently operate inspection schemes,[16] and data received from these councils has been used to help estimate administration and compliance costs.

Where there is a great deal of uncertainty around estimates of the benefits, they have not been included in the quantitative analysis. However, their significance has been included qualitatively as an indication, and they are discussed further in 7.3.3.

A further evaluation will be undertaken after consultation when a report and recommendation on the comments and proposed regulations (standards) is provided to the Minister for the Environment for consideration. Section 32 of the RMA requires that an evaluation be undertaken of whether, having regard to their efficiency and effectiveness, the methods in the NES are the most appropriate. The benefits and costs of the proposals and the risk of acting or not acting if there is uncertain or insufficient information must also be taken into account.

7.2 Overview of the analysis

The potential impacts of the proposed standard are analysed from the perspective of society as a whole. This includes all impacts regardless of whether they are incurred by, or accrue to, private inspectors, regional and territorial authorities, central government or households. Also, this analysis measures only the *additional* costs and benefits that would be generated by the proposed standard, and which would not occur otherwise, which means that few, if any, additional costs or benefits would be generated in those areas that already operate WOF-type inspection schemes.

Out of an estimated total of 270,000 on-site systems in New Zealand, it is estimated that approximately 15 percent, or 42,000 systems, would be located in areas that are either hotspots with existing problems or areas where there is a high risk of environmental degradation from failing on-site systems (EMS Ltd, 2007). Of these systems, around 2,000 are likely to be located in areas where there is already an inspection system. Consequently, the number of systems used to calculate cost estimates is 40,000.

[16] These authorities include the Far North District Council, Environment Bay of Plenty and Waitakere City Council.

7.3 Costs

7.3.1 Administration and inspection costs

Assuming a three-year period to implement the proposed standard, the cost of inspecting 13,000 systems per year is estimated to be around $470,000. The initial administrative cost for all councils is estimated to total $210,000 in the first year of the scheme, which includes work to identify hotspots and sensitive areas. The one-off costs of establishing training and certification for inspectors is estimated to be around $30,000 (borne by the Ministry for the Environment). The labour costs incurred in training enough inspectors (around 300) would be approximately $22,000. Approximately 10 full-time equivalent staff would be required for ongoing administration by councils, at a cost of $800,000 per year. The cost for property owners is estimated at $35 per inspection,[17] with one inspection every three years.

7.3.2 Compliance costs

Compliance costs include the costs of repair, maintenance and system upgrades that would not occur without the implementation of the proposed standard. Assuming that 15 to 50 per cent of all systems in hotspots fail a WOF inspection, the total estimated compliance costs imposed by this scheme could be around $2.1 million to $7.8 million per year for the first three years. These estimates account for the fact that a proportion of systems would need one-off repairs or upgrades to bring them up to the required level. After this initial three-year period, during which all the systems in the targeted areas would be inspected at least once, ongoing compliance would be expected to fall to around $2 million to $3.1 million per year.

7.3.3 Total costs

Based on the assumptions discussed above, the total cost of the proposed standard is estimated to range from $31.9 million to $48.9 million in current dollars. The largest component would be compliance costs. This equates to an average cost of $3.4 million to $5.2 million annually for the next 20 years.

[17] This is based on fees paid in the Bay of Plenty region and is exclusive of GST. This charge would cover all costs, including staff wages, vehicle depreciation, fuel, materials, etc. This analysis assumes inspections would take an average of 30 minutes.

Table 6: Total costs (current dollars, 20-year period)

Cost type	Cost ($ million)	
Failure rate:	**15%**	**50%**
Inspection (property owners)	4.0	4.0
Administration (regional councils)	7.0	7.0
Compliance (regional councils)	20.9	37.9
Total	**31.9**	**48.9**
Average (per year)	**3.4**	**5.2**

7.4 Benefits

Although on-site wastewater systems located in targeted areas are only around 15 per cent of the total, these systems are likely to account for a much larger proportion of the public health and environmental impacts. This is because the locations have been selected as hotspots based on the relatively significant negative impacts caused by on-site systems.

Because these hotspots are likely to account for a disproportionate level of negative impacts, applying a WOF inspection scheme to this 15 per cent of systems is estimated to lead to a 30 to 50 per cent reduction in the public health costs and environmental damage arising from on-site systems.

7.4.1 Public health impacts

Although it is impossible to accurately determine the precise impact of reduced contamination of drinking-water, recreational water bodies, shellfish and ground surfaces in targeted areas, the magnitude of these impacts could be a potential reduction in public health costs of around $500,000 to $3.0 million per year. This is based on assumptions derived from information and opinions obtained from various organisations, including the Ministry of Health, various regional and territorial authorities, the New Zealand Food Safety Authority, Northland District Health Board, NIWA, and various experts who have carried out studies of infections from water-borne and food-borne pathogens.

Cost−benefit analyses of safe sanitation (drinking-water supplies and sewerage) have been evaluated on several occasions but tend to be incomplete because of the standard of notified illness data available for water-borne diseases in New Zealand. In rural areas people often do not seek medical advice for diarrhoea, and overworked rural GPs rarely report notifiable diseases. Yet New Zealand has some of the highest notified water-borne disease rates in the OECD, and such rates are likely to be under-reported by between 10 and 100 times.[18]

[18] This fact has been adversely commented on in the OECD's *Environmental Performance Review of New Zealand*, which was released on 5 April 2007.

7.4.2 Environmental benefits

Although the environmental benefits of improving the performance of on-site systems are largely unquantifiable, an attempt has been made here to indicate the likely extent of the impact that on-site systems may be having on the environment. Waterways and ecosystems that become polluted with effluent can suffer adverse environmental effects. For instance, excess algal growth caused by elevated nutrients or the digestion of wastewater can deprive waterways of oxygen. Fish and other aquatic life can die as a result. Reduced contamination from on-site systems as a result of a WOF scheme would provide various benefits, such as increased water-based recreational activity or reduced risk of closure of commercial shellfish farms.

Table 7 provides estimates of the number of waterways located near potential hotspots that have been identified in earlier research. Improving the performance of failing systems in hotspot areas will contribute to improving the environmental quality of these areas.

Table 7: Estimate of waterways in hotspots affected by failing systems

Localised area around systems and nearby stormwater drains	Total number
Groundwater sites	c. 10
Streams	100−120
Rivers	10−20
Lakes	c. 10
Estuaries	10−20
Sheltered marine	40−60
Open coastal	30−50

Source: EMS Ltd, 2007.

Note: The figures in this table need to be regarded with some caution, and should be considered approximate estimates only. These figures are likely to underestimate the number of water bodies potentially affected, because of under-reporting by local authorities (eg, where monitoring is not occurring). This is especially the case for effects on groundwater and lakes.

Preferences for reduced environmental damage

Nutrient inputs from failing on-site systems are generally not in high enough concentrations (in comparison with other catchment sources) to cause substantial adverse impacts. However, they do contribute to the cumulative effects caused by multiple sources that may contaminate a catchment. In some locations, however, on-site systems may generate substantive negative environmental impacts themselves, such as in enclosed water bodies that are sensitive to high input of nutrients from on-site systems in comparison to other sources. Any reduction of this environmental damage would constitute a benefit.

This benefit would arise because many people in society have a preference for reduced pollution and less environmental damage. This preference may exist even if the benefits of a cleaner greener environment are not enjoyed directly. There would be acceptance of the measures being introduced in the knowledge that they would for example help to protect New Zealand's 'clean green' image.

Increased recreational activity

Where recreational areas such as beaches and lakes become contaminated, councils may place signs warning the public of the risks of using these areas. In some cases, beaches may be closed. Even if there is no formal action taken by councils or authorities, communities may become aware of the level of contamination of certain beaches and lakes over time.

The effect of these measures, and increased awareness of contamination, is to reduce the recreational use of these areas. The inability, or unwillingness, of people to use the areas constitutes a cost. This cost may manifest itself in the form of additional time and expense incurred in travelling to alternative areas or, if there are no nearby alternatives, there is a cost in the form of lost enjoyment from not being able to engage in water-based recreational activities at all. To the extent that an inspection scheme would reduce contamination of these areas and thereby increase recreational activities, this would constitute a benefit.

Increased commercial shellfish production

A reduction in the contamination of marine waters used to farm shellfish would reduce the likelihood of the harvesting of shellfish crops being prohibited in affected areas. In some cases contamination may cause delays in harvests; in other cases entire marine farms may be closed or prevented from being established. An example of farm closure occurred at Waikare Inlet in the Bay of Islands. In this case, nine oyster farmers were forced to close their farms in 2001 after traces of the norovirus carried in human effluent were discovered.[19] These farms accounted for 30 per cent of New Zealand's oyster production, a significant proportion of which is exported.[20]

The farmers subsequently sued the Far North District Council for $12 million in damages (largely lost output), blaming a nearby treatment plant for the contamination. During the case the Council suggested that nearby on-site systems could be a major contributing factor to the level of contamination. Subsequently, the court found that the treatment plant could not be proven to be the source of the contamination.

Another example is the contamination of the marine area of Papanui Inlet in Dunedin City, which has resulted in the Council prohibiting this area from being used for commercial marine farming.

To the extent that an inspection scheme allowed for greater production from marine farms, the benefit could be substantial, perhaps in the region of millions of dollars.

[19] "No appeal by oyster farmers", *Northern Advocate*, 14 November 2006.

[20] "Pollution hit oyster-growers hoping to re-open farms", *New Zealand Herald*, 20 November 2006.

Reduction in disputes

As well as disputes over the contamination of marine farms, there have also been disputes between developers, councils and/or district health boards regarding contamination from on-site systems. Because of the occasional difficulties faced in gathering sufficient evidence that on-site systems are responsible for public health impacts in specific areas, actions by district health boards and/or councils may be challenged in court, for instance by developers. To the extent that a national environmental standard provides support for the actions or policies of district health boards and/or councils and reduces the scope for challenge, this constitutes a benefit in that expensive legal action may be avoided.

7.5 Conclusion

Applying a proposed standard to targeted areas results in an estimated total cost, in current dollars, ranging from $3.4 million to $5.2 million per year over 20 years ($31.9 million to $48.9 million), the largest component of which would be compliance costs for the owners of on-site systems. To generate a positive net impact for the wider community, a proposed standard would need to create annual benefits of, on average, $3.4 million to $5.2 million. Given that the public health benefits alone could be in the vicinity of up to $3 million per year, a targeted inspection scheme appears likely to be able to provide a net benefit to society.

Questions

17. Have we accurately reflected the range of costs and benefits arising from the proposals for a national environmental standard, and who might bear the costs or receive the benefits?
18. Are there any costs and benefits we have overlooked?
19. Do you have information you would like to see included in the cost−benefit analysis that will be carried out after the submissions are received and analysed?
20. Are our estimates of costs and benefits accurate?
21. Do you have information on costs and benefits that could assist the second stage of our assessment (of the impacts of any final proposals)?
22. Do you have any information on costs and benefits that we have been unable to quantify?

8 What Happens Next?

8.1 Making a submission

Any person can make a submission on the subject matter of the proposed standard. The questions at the end of each section have been gathered together below to help you to organise your responses.

Please include the following information with your submission:

1. Your name and postal address, phone number, fax number and email address (where applicable)
2. The title of the proposed standard you are making the submission about
3. Whether you support or oppose the standard
4. Your submission, with reasons for your views
5. Any changes you would like made to the standard
6. The decision you wish the Minister for the Environment to make.

You must forward your submission to the Ministry for the Environment, PO Box 10362, Wellington, or by email to standards@mfe.govt.nz, in time to be received no later than:

5.00pm on 26 September 2008.

Note: your submission is public information and will be subject to release under the Official Information Act 1982.

8.2 What happens to submissions

The Ministry will prepare a summary of submissions. The summary will be available through the Ministry's website, and hard copies will be available on request. Once submissions have been compiled they will be considered during the development of the proposed standard. The Ministry will prepare a report with recommendations on the comments and subject matter of the standard for the Minister for the Environment, including a section 32 (cost-benefit) analysis. The report and recommendations will be publicly notified. If the Minister's approval is given to continue developing the proposed standard, the final wording will be drafted and the proposed standard made into regulations.

Questions

Your submission may address any aspect of the proposed subject matter of the standard. However, the Ministry for the Environment would also greatly appreciate any specific comment you may have on the following questions.

Problems

1. Have the problems been defined correctly?
2. Are there other problems you can think of?
3. What is the magnitude of these problems?

Options

4. Do you agree with the policy objective?
5. Is there an alternative approach that has not been considered?
6. Do you agree with the analysis provided in this section?

Proposed standard

7. Do you have any general comments about the proposed standard for the inspection and maintenance of on-site wastewater systems?
8. Should the proposed standard apply to private dwellings only, or should it apply to all on-site systems (including consented systems) that treat domestic wastewater, including hotels, motels, camping grounds, restaurants, schools and marae?
9. Do you agree with the inspection interval of three years?
10. Should inspections be coupled with an immediate pump-out?
11. Do you agree with the proposed critical components for the checklist (see Appendix 7)?
12. Should the proposed standard prescribe a minimum level of treatment (eg, secondary) for new on-site systems? (This could have the effect of banning the installation of new septic tanks in favour of treatment systems that provide greater levels of treatment.)

Implementing the proposed standard

13. Should the proposed standard apply to targeted areas as proposed, or across the whole of New Zealand?
14. Do you agree with the risk assessment methodology and the proposed criteria for identifying targeted areas?

15. Do you see any problems with the implementation and administration of the proposed standard?

16. What would be an appropriate training level for inspectors/certifiers? Is a unit standard qualification for inspectors an appropriate method for ensuring consistency of inspectors?

Benefits and costs

17. Have we accurately reflected the range of costs and benefits arising from the proposals for a national environmental standard, and who might bear the costs or receive the benefits?

18. Are there any costs and benefits we have overlooked?

19. Do you have information you would like to see included in the cost−benefit analysis that will occur after the submissions are received and analysed?

20. Are our estimates of costs and benefits accurate?

21. Do you have information on costs and benefits that could assist the second stage of our assessment (of the impacts of any final proposals)?

22. Do you have any information on costs and benefits that we have been unable to quantify?

Appendix 1: Definitions

Cluster systems	On-site systems that serve two or more houses, but less than an entire community. The wastewater from each group of dwellings may be treated on-site by individual septic tanks before the effluent is transported through alternative sewer systems to a nearby off-site location for further treatment and ecosystem re-entry.
Disposal field	In most cases this comprises a subsurface 'field drain', such as perforated pipes. The idea is that the wastewater percolates into unsaturated soil at least 600 mm above the groundwater table. This way the wastewater is renovated in the unsaturated soil profile by microbial and physico-chemical processes.
Domestic wastewater	Wastewater or sewage from domestic households originating from toilets, urinals, kitchens, bathrooms, showers, baths, basins and laundries, such as from a dwelling, but excludes stormwater flows.
Environmental performance	The performance of on-site wastewater treatment systems relative to both public health protection and protection of the natural and physical environment.
Escherichia coliform (E. coli)	One of the species of bacteria in the coliform group. Its presence is considered indicative of fresh faecal contamination.
Faecal coliform	Bacteria present in waste from warm blooded animals (mammals or birds) and used as an indicator of pollution in water.
Failure	A situation where the effluent is not treated to a sufficient standard before entering groundwater or surface waters, or where inadequately treated effluent rises to the ground surface (usually near the on-site system). The failure of an on-site system may cause a risk to human health or the environment.
Hotspot	An area with high numbers of (failing) on-site systems within a larger area of low or normal density.
Primary systems	These systems involve separating bulk solids, grease and grit from the main liquid stream. Septic tanks are a well-known traditional example of on-site primary systems. Typical primary systems are either single-chamber or two-chamber septic tanks.
Secondary systems/ advanced on-site systems	These systems involve biological processes to biodegrade the organic contaminants in the wastewater. Secondary treatment processes can include wastewater aeration, such as aerated wastewater treatment systems (AWTS), treatment and filtering media, disinfection, and other technologies. These systems are typically designed, operated and maintained by specialist companies. The disposal field often includes dripper lines and evapo-transpiration beds. Advanced systems are generally used in more 'difficult' sites, such as in poorly drained soils, in close proximity to surface waters, or where there is limited room for the disposal field.
Septage	Liquid or solid material removed from a septic tank, cesspool, portable toilet, or similar system that receives only domestic (non commercial) waste.
Septic tank	Septic tanks comprise two distinct components: a solids settling tank (the septic tank) and an effluent disposal field. The main function of the tank is to allow solids to settle out and scum and fat to float to the surface. The liquid fraction is then drawn off by gravity from a pipe just below the surface of the wastewater. Some septic tanks have multiple chambers to improve solids removal, but the majority are simple single-chamber tanks.
Sludge	The material that settles out of wastewater primary and secondary treatment systems; the solids layer at the bottom of a septic tank.

Tertiary systems	The treatment process following secondary treatment can involve the use of sand filters to further improve the removal of organic matter (fine solids) from biological secondary treatment, and the use of disinfection units to remove human intestinal bacteria before treated effluent discharge. Disinfection can be achieved for on-site treatment units via tablet chlorination or ultraviolet light units.
Wastewater	Also known as sewage, wastewater includes the water you flush down your toilet and the water that drains from your bathtub, sink, washing machine and many other domestic sources.

Appendix 2: Current Consent Status and Provisions for Maintenance and Inspection of On-site Wastewater Systems

Regional council	Consent status	Maintenance and inspection
Environment Waikato	Taupo: Existing and new systems are permitted activities. However, after 2013 existing systems in the near-shore zone will become controlled. Their status may also change depending on lot size. Region: Existing and new systems are permitted until changes of the site or the system occur. Then the system must be either upgraded to permitted activity for a new system, or a discharge consent applied for.	The owner provides a maintenance certificate to the council every three years for existing systems, and every five years for new systems. New systems are required to be maintained in line with TP58. There are no maintenance provisions for existing systems. Permitted activity criteria for the rest of the region are not specific about what has to be checked, just that the owner is responsible.
Environment Bay of Plenty	Rotorua: Existing conventional systems are permitted. Discharges from new conventional systems are a discretionary activity. Existing and new advanced systems are permitted. Systems located in specific areas will become discretionary after 2010. Outside Rotorua catchments: Existing and new conventional and advanced systems are permitted. However, systems located in certain areas will only be permitted until 2010, after which the consent status will change.	Existing systems are required to have maintenance and performance inspection, an approved certifier, and pump-out every three years. A certificate is issued to Environment Bay of Plenty **(**EBOP). Existing and new advanced systems are maintained in accordance with the manufacturer's design. Existing and new conventional systems are subject to a maintenance and performance inspection programme, pump-out every three years (six years for new systems), and inspection of the system by an EBOP approved inspector. Existing and new advanced systems are maintained according to the manufacturer's design specifications, including desludging. Records are forwarded to EBOP.
Auckland Regional Council	New and existing systems are permitted.	New aerobic type systems have a programmed maintenance contract. There are no provisions for existing systems yet, but the proposed Air, Water and Land Plan means they will require maintenance.
Hawke's Bay Regional Council	Existing and new systems are permitted. Large-scale systems and systems located in sensitive areas are discretionary.	There are maintenance provisions for existing and new systems.
Taranaki Regional Council	Systems are permitted.	Systems are maintained according to TP58 and the *NZ Manual of Alternative Wastewater Systems*. There are no inspection provisions within the rule.
Environment Canterbury	Existing and new systems are permitted. Systems located in sensitive areas are discretionary.	Inspection and maintenance are required for all systems. Information is recorded and forwarded to Environment Canterbury (ECAN) upon request. At present, and due to lack of resourcing, ECAN staff do not routinely require these records unless they have been alerted to an issue.
Greater Wellington Regional Council	Existing and new systems are permitted.	The system should be maintained on a regular basis. There are no requirements for records to be kept or sent to the Council. Only the few septic tanks that have resource consent are monitored.

Regional council	Consent status	Maintenance and inspection
Northland Regional Council	Existing systems and existing primary treated effluent into land via deep soakage and rapid infiltration are permitted. New primary treated effluent to land via deep soakage and rapid infiltration is discretionary. Primary and secondary treated effluent from on-site wastewater systems is permitted.	There is a programmed maintenance contract only for secondary systems, and no requirement for records to be kept and/or supplied to the Council. There are no requirements for maintenance and inspection for the rest of the existing or new systems or effluent.
West Coast Regional Council	Discharge from existing and new systems is a permitted activity.	Maintenance should be in accordance with TP58. Systems that have discharge permits are required to be maintained in accordance with the manufacturer's specifications.
Environment Southland	Existing and new systems are permitted	There is a requirement for maintenance, but no requirement for records to be kept and/or supplied to the Council. The Council only monitors consented systems.
Horizons Regional Council	Existing and new systems are permitted, but if systems do not comply with the rule they will require resource consent.	There are no inspection and maintenance provisions linked to the rule.
Otago Regional Council	Existing and new systems are permitted, but if discharge from systems enters water it is a discretionary activity.	There are no inspection and maintenance provisions linked to the rule.
Tasman District Council	Sensitive areas: Systems that have secondary treatment are permitted. If systems do not have secondary treatment they are considered discretionary. Systems located in the Wastewater Management Area are controlled. For properties over 2 ha the activity is controlled; for under 2 ha it is restricted discretionary. Rest of the district: existing and new systems are permitted.	There is a written maintenance and monitoring contract, with an experienced operator. The contract specifies the frequency of maintenance and inspections. A signed copy of the contract is forwarded to the Council. Systems are serviced and inspected not less than every six months. Rest of the district: There are no inspection and maintenance provisions linked to the rule.
Marlborough District Council	Existing systems are permitted. New systems will require resource consent.	Existing and new systems are required to be maintained. The Council is investigating options for co-ordinating pump-outs and disposal of waste. Advanced systems are required to have a maintenance contract on at least a six-monthly basis. Records are required to be kept and supplied to the Council.
Nelson City Council	Existing systems are permitted. New systems are permitted if the lot size is 15 ha or greater. If the lot size is smaller than 15 ha, the new activity is discretionary. New larger-scale systems (industrial/commercial) are discretionary.	Existing systems are required to be maintained in accordance with the manufacturer's specifications. New systems are required to be regularly desludged.
Gisborne District Council	Existing and new systems are permitted. If a sewerage system is available it becomes restricted discretionary. Larger-scale systems are also restricted discretionary.	There are no inspection and maintenance provisions linked to the rule.
Far North District Council		All septic tanks are to be cleaned every three years. Confirmation is to be sent to the Council to be entered into the database. Inspections by the Council are not regular. Aerated systems, composting toilets and other approved systems must be maintained. Proof of maintenance must be presented to the Council within 30 days of maintenance.

Regional council	Consent status	Maintenance and inspection
Waitakere City Council		There is a maintenance and inspections programme. A department of Waitakere City Council pumps out the tank every three years. This is charged for as rural sewage in land rates.
Auckland City Council		Pump-outs are required every three years and a copy of the pump-out receipt sent to the Council within 14 days after the pump-out. An officer of the Council may enter any property and inspect any septic tank to check the condition of the tank and determine whether it has been pumped out in a satisfactory manner.

Appendix 3: Basic Outline for a Risk-based Methodology to Identify Targeted Areas

The parameters for identifying areas of environmental risk may include:

1. climate
2. land slope
3. aspect
4. soil type
5. erosion potential
6. drainage
7. building density and property size
8. groundwater levels
9. groundwater recharge zones and/or groundwater protection zones
10. proximity to waterways, including fresh water and the coastal environment
11. sensitivity of the local environment
12. flood hazard
13. existing buffer zones or rules in regional plans relating to on-site systems.

The criteria for identifying hotspot areas may include:

1. locations with a history of problems with on-site wastewater disposal, identified through sanitary surveys or pollution hotline complaints or monitoring
2. areas identified in plans or strategies as locations for intensification of land use, long-term growth or development, where sewage reticulation may not parallel development
3. communities with a high proportion of on-site systems that use shallow groundwater for drinking-water
4. areas of highly seasonal occupation (relevant especially in attractive tourism spots) and not adequately designed on-site systems to cope with shock loads.

Councils could consider undertaking a broad-scale risk assessment utilising GIS assessment and spatial modelling that considers the range of factors listed above. The development of a risk model would require the selection of parameters appropriate to the specific region (eg, slope, soil types, section size), determination of hazard classes (eg, 10 per cent slope = low hazard), and the application of weightings to each parameter (eg, section size may be weighted as it is more critical to system performance than soil category). In addition, hotspot areas next to the areas of environmental risk need to be considered.

Stakeholder consultation could then be undertaken within these shortlisted areas to allow the council to make an informed decision on where the proposed standard would be appropriate.

Appendix 4: WasteTRACK

What is WasteTRACK?

WasteTRACK is an internet-based database, which consolidates manifest, facility and carrier data to track liquid and hazardous wastes from generation, through transport to treatment or disposal. WasteTRACK is administered under contract to the Ministry for the Environment.

Each time a waste movement is requested by a waste generator (in our case, a household), the waste contractor (septic tank cleaners, suckers and dumpers, etc) creates a tracking form with a unique number that follows that waste from pick-up through to ultimate treatment/disposal. This allows each individual waste movement to be monitored.

WasteTRACK uses the waste contractor as the key operator in the tracking process. Before a contractor can begin using WasteTRACK, information on the operation must be entered into the database so that when a tracking form is being created the contractor can access that information.

There is a list of contractors registered with WasteTRACK, which the household can access via the internet. However, some households do not have an internet-connected computer at home, so if the standard is implemented councils could provide this information. There are around 50 contractors under 'septage waste category' who are actually installing or replacing septic tanks and doing pump-outs.

How does it work?

There are a number of stages, as follows.

1. Waste is produced by a generator household.
2. The household looks up the most suitable contractor from WasteTRACK.
3. The contractor arranges to collect the waste from the house and opens a new tracking system.
4. The tracking form is printed off and given to the driver.
5. The driver places the tracking form in the cab. The driver visits the household and collects the waste and takes it to the appropriate treatment plant.
6. The treatment plant accepts the waste if the tracking form is completed correctly. The plant then logs in and completes their part of the tracking form.
7. The contractor closes the tracking form.

Benefits of using WasteTRACK

The WasteTRACK system:

- ensures the safe transportation of wastes (septic tank sludge) to an approved treatment/ disposal facility
- monitors and tracks wastes to prevent unauthorised discharge into the natural environment
- collates information to help central and local government identify priority waste management issues, and to help develop good policy
- provides an even and competitive system for companies in the broader waste management industry.

WasteTRACK has been developed to ensure that it meets these requirements by:

- requiring waste treatment and disposal locations to be approved before being entered into the tracking system
- allowing regulators to monitor the waste transporters that are entered into the system, which reduces regulators' time as they can focus on those businesses that are not using WasteTRACK
- allowing for the information in WasteTRACK to be extracted via reports to assist with waste management and business planning
- requiring all contractors to use WasteTRACK and meet the same standard, which means the industry will operate on a level playing field.

Appendix 5: List of Participants in 2006/2007 Working Group

Helen Codlin	Hawke's Bay Regional Council
Marc Fauvel (reserve Paul Cooper)	Rotorua District Council
Robyn Floyd	Auckland Regional Council
Ian Gunn	Technical expert
Bianca Sullivan	Environment Canterbury
John Whale (reserve Janine Barber)	Environment Bay of Plenty

Appendix 6: Things You Need to Know About Your Septic System

This list provides a series of questions that, if you can answer, will indicate you have a basic understanding of your on-site wastewater system.

- What type of septic system do you have?
- Where is it located?
- Where is the repair area located?
- Is the septic system working properly?
- Has it been maintained in the past?
- What can you do on a day-to-day basis to keep your system working properly?
- What maintenance is needed in the future?

Appendix 7: Key Components of an Inspection Checklist

Provided below is a broad summary of the key components of a checklist for the inspection and assessment of on-site wastewater management system performance. It is not exhaustive and does not contain the level of detail necessary to fully assess systems. It is provided here as a guide to the possible structure of such a checklist.

- *Property details* − location, owner details, identification/consent numbers, type of facility and estimated occupancy/wastewater generation.
- *Inspection details* – date, time, weather, inspector.
- *Wastewater management system summary* – type of system (treatment, dosing, land application), location (including site sketch and GPS log), management regime (eg, owner maintained, service agent, utility managed), and any relevant discharge consents.
- *Site and soil (environmental) risk factors* – a brief summary of the general site and soil characteristics (section size, slope, soil category, depth to limiting layer).
- *Drainage pipework assessment* – a visual check to determine the condition and configuration of drainage (eg, is greywater separate? where are the different fixtures draining to?).
- *Treatment and conveyance component assessment* – this may include dimensions, estimated or known operating capacity, physical condition of components, treatment process assessment, sludge and scum accumulation, and stormwater infiltration.
- *Land application system assessment* – this may include the dimensions and estimated or known operating capacity, physical condition (vegetation cover, compaction), assessment of the condition of components (broken pipework, pumps and controls), hydraulic failure (observed signs of failure, load testing), proximity to sensitive receptors (such as streams, drains, recreational areas).
- *Summary assessment of performance* – a listing of conclusions on the key performance criteria and a statement of any remedial works required.

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