Ministry for the Environment
Manatū Mō Te Taiao

Proposed National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

Evaluation under Section 32 of the Resource Management Act

New Zealand Government

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Land affected by contaminants in the soil needs to be identified, assessed and, if necessary, managed at the time of development to ensure it is safe for people to use. However, existing controls are either absent, inadequate or inconsistently applied. A national environmental standard (NES) is proposed that provides a suite of scientifically derived soil contaminant values that trigger an appropriate management action. It also prescribes nationally consistent land-use and subdivision rules that ensure land is fit for its intended use. This report provides an evaluation of the proposed NES under section 32 of the Resource Management Act 1991 (the RMA).

The evaluation found that the NES will enable economic use to be made of contaminated land while protecting the health of future residents. The impacts of the NES are expected to be greatest in those areas that have no explicit contaminated land rules or processes in place to address potential contamination and that are unlikely to develop any in the near future.

The NES is practicable and precisely targets the area of contaminated land policy that is presently weak. It is also designed to complement or give additional weight to the existing suite of central government initiatives.

A number of options were considered alongside an NES, including the status quo. All options were assessed against the following policy criteria:

- provides certainty of policy content
- creates administrative efficiency
- promotes national consistency.

It was concluded there will be both costs and benefits of the NES. Having considered the available options, the NES is considered the most appropriate way of achieving the policy objective, with the main benefits being national consistency in human-health thresholds and improved administrative efficiency.

Overall, it is considered the NES is the most appropriate, effective and efficient means of achieving the objective of ensuring land affected by contaminants in soil is appropriately identified and assessed at the time of being developed, and, if necessary, remediated to make the land safe for human use.

1 Introduction

1.1 Overview

The Minister for the Environment proposes to introduce a National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (the NES). This report provides an evaluation of the proposed NES under Section 32 of the RMA.

1.1.1 National environmental standards

The RMA enables the Minister for the Environment to prepare national environmental standards covering any matter referred to in sections 9, 11, 12, 13, 14 or 15 of the RMA. These standards have the force of regulation and are binding on local authorities. An NES may:

- prohibit or allow an activity
- restrict the making of rules or the granting of resource consents for specified matters
- require certification of compliance with the regulations
- specify the effect of the regulations on existing rules, and require local authorities to review existing resource consents within particular timeframes.

1.1.2 The Proposed National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

The objective of the NES is to ensure land affected by contaminants in soil is appropriately identified and assessed at the time of being developed, and if necessary is remediated or the contaminants contained to make the land safe for human use. The NES would provide nationally consistent sets of planning controls and soil contaminant values for assessing and managing contaminants in soil. The NES proposes having a:

a) permitted activity status (no resource consent required) for the removal or replacement of fuel storage systems, impacted soil, and associated subsurface soil sampling

b) permitted activity status (no resource consent required) for small-scale (no greater than 25 cubic metres per 500 square metres of affected land) and temporary (two months' duration) soil disturbance activities

c) permitted activity status (no resource consent required) for sampling activities

d) permitted activity status (no resource consent required) for subdividing land and changing land use where a preliminary investigation shows it is highly unlikely the proposed new use will pose a risk to human health

e) controlled activity status (resource consent required[1]) for the development of land where the risk to human health from soil contamination does not exceed the applicable soil contaminant value

[1] Under a *controlled activity*, the consent authority must grant the consent and can impose conditions on the consent, but only for those matters for which control is reserved in an NES.

f) restricted discretionary activity status (resource consent required[2]) for the development of land where the risk to human health from soil contamination exceeds the applicable soil contaminant value

g) discretionary activity status (resource consent required) for the development of land where the activity does not meet the requirements to be a restricted discretionary, controlled or permitted activity.[3]

Details of the NES as approved by Cabinet are included in Appendix A and they are discussed further in the remainder of this report.

1.1.3 Background to the NES

New Zealand's legacy of soil contamination is mainly associated with past activities and industries involving chemicals (hazardous substances), where spills, leaks and/or the disposal of wastes have led to the presence of contaminants in the soil. The historical activities that have led to soil contamination include the manufacture and use of pesticides, fertilisers and petroleum products, the production of coal and gas, mining, timber treatment, and livestock dipping.

Since the early 1990s, councils have identified approximately 20,000 sites that are affected or potentially affected by contaminants from industrial, domestic or agricultural activities. Many of the more seriously affected sites have been identified and managed. However, many other sites are yet to be properly assessed, and it is expected that many additional sites will be identified over the coming years.[4]

New Zealand is fortunate that the scale of soil contamination is low relative to more industrialised countries. However, whereas most other developed countries have enacted specific legislation for contaminated land decades ago, the awareness of contaminated land issues emerged relatively late in New Zealand such that the RMA, when enacted in 1991, did not specifically take them into account. It was not until the RMA amendments of 2005 took effect that contaminated land functions were assigned to local authorities.

In 1992, the Australian and New Zealand Environment and Conservation Council (ANZECC) published the *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*. These guidelines were the cornerstone policy document for contaminated land in both countries, and were adopted to varying degrees by some councils (eg, the former Auckland City Council, the former Waitakere City Council, Waimakariri District Council, Environment Southland, Northland Regional Council and Otago Regional Council).

The Ministry for the Environment has published a suite of technical guidelines on assessing and managing contaminated land. Industry-specific guidelines for timber treatment sites and gasworks sites were first published in 1997, and the Contaminated Land Management Guideline (CLMG) series commenced with the first guideline, *Guidelines for Reporting on Contaminated*

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[2] Under a *restricted discretionary activity*, the consent authority can exercise discretion as to whether or not to grant consent and to impose conditions, but only over matters for which discretion is restricted in an NES.

[3] Under a *discretionary activity*, the consent authority can exercise its full discretion as to whether or not to grant consent, and to impose conditions.

[4] For example, the Ministry estimates there are thousands of former sheep-dip sites across New Zealand. Their number, location and level of contamination remain largely unknown (Ministry for the Environment, 2010).

Sites, published in 2001. Since that time there have been additional industry guidelines and a series of 10 guidelines in the CLMG series, some of which have been updated since their first publication. Section 2.3.7 of this report provides more details on the guidelines.

In 2006, the Ministry began a review to establish how best to achieve a comprehensive policy framework for managing contaminated land. The review looked at all the policy measures which made up New Zealand's contaminated land policy framework including legislation, regulations, strategies, funds and guidelines. The existing framework was considered to have gaps which could be addressed by either national environmental standards or best practice guidance.

A discussion paper (Ministry for the Environment, 2006) to stimulate discussion on a comprehensive framework was released in 2006, with extensive consultation carried out in early 2007. A position paper (Ministry for the Environment, 2007a) released in late 2007 identified three initiatives as being of high priority:

- the development of nationally consistent methods and numbers that protect human health, delivered via an NES and guidance
- the development of nationally consistent land-use and subdivision rules, possibly delivered via an NES
- the continuation of the Contaminated Sites Remediation Fund.

The scoping and development of the NES addressing the first two priorities above began in 2008, culminating in the release of a proposed NES discussion document in February 2010.

1.1.4 Consultation on the proposed NES

To meet the requirements of the RMA,[5] the proposed NES discussion document was publicly notified on 6 February 2010 in the main national and regional newspapers, distributed to iwi authorities and made available to the public. Fourteen workshops were held during March, attended by around 460 people. Submissions closed on 19 April 2010. Matters raised by submitters and the responses to those submissions are outlined in section 4 and Appendix C.

1.1.5 Scope

The NES covers assessing and managing the actual or potential adverse effects of contaminants in soil on human health from the following activities:

- soil/site investigations
- the use, development and subdivision of land.

Although implementation of the NES will enable councils to consider the effects of contamination on the use and development of land, it does not prescribe standards to assess and manage the actual or potential adverse effects on other receptors, including:

- the on-site and off-site ecology
- the on-site and off-site effects on surface water

[5] Section 44(2) of the RMA requires public notification and an opportunity for the public and iwi authorities to comment on the proposed NES.

- groundwater – including human drinking-water sources
- amenity values.

Councils may impose additional controls to address any potential or actual effects on these receptors.

The focus of the policy objective is on making the land safe for human use. This focus recognises the quality of soil affected by contaminants has already been compromised, and so ensuring that human health is protected is a pragmatic approach to enabling a safe use of such land. As a result, the scope of the NES is restricted to protecting human health. This should not detract from the ongoing role of regional councils and territorial authorities to assess ecological and other impacts on a site-by-site basis in accordance with their functions under the RMA.

1.2 The section 32 evaluation and report

Section 32 of the RMA requires the Minister for the Environment to evaluate any proposed NES and to prepare a report summarising the evaluation. Section 32 is attached in full in Appendix B. The requirements contained within section 32 of the RMA are as follows.

> (3) An evaluation must examine:
>
> (a) the extent to which each objective is the most appropriate way to achieve the purpose of this Act; and
>
> (b) whether, having regard to their efficiency and effectiveness, the policies, rules, or other methods are the most appropriate for achieving the objectives.
>
> ...
>
> (4) For the purposes of this examination, an evaluation must take into account:
>
> (a) the benefits and costs of policies, rules, or other methods; and
>
> (b) the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the policies, rules or other methods.

This report provides an evaluation of the appropriateness of the NES in terms of achieving the purpose of the Act in section 3.3 below. The evaluation of efficiency and effectiveness is given in section 5. A detailed cost–benefit analysis comparing the NES to the status quo was completed as part of developing the NES (Covec, 2010) and has been used to inform the evaluation of efficiency and effectiveness for the purposes of section 32.

2. Statement of the Issues

2.1 The legacy of contaminated land in New Zealand

The past use of chemicals (hazardous substances) in industry, agriculture and horticulture has left a legacy of soil contamination in New Zealand. This contamination is mainly caused by past practices, including the storage and use of hazardous substances and the disposal of hazardous wastes. The most common activities that have led to the creation of contaminated sites in New Zealand are as follows.

- *The manufacture and use of pesticides:* these activities have resulted in contamination at locations where pesticides were manufactured as well as wider contamination associated with the use of the chemicals (eg, agrichemical sprays). Well-known examples of contamination from these activities are:
  - the Fruitgrowers' Chemical Company site at Mapua
  - disposal of waste chemicals from the Dow Agrichemical site in New Plymouth
  - horticultural land affected by the use of agrichemical sprays.
- *Production of gas and coal products:* this includes many old gasworks sites located in most towns and cities. Well-known examples of contamination from these activities include:
  - disposal of waste products from the former Auckland gasworks as fill beneath some parks and residential areas
  - the Rotowaro Carbonisation Plant near Huntly.
- *Production, storage and use of petroleum products:* contamination has resulted from leaking fuel storage facilities at tank farms and service stations. Well-known examples include the contamination of Auckland's Western Reclamation caused by leaking bulk storage tanks.
- *Historical mining:* this is usually associated with metals leaching from old tailings dams and mine shafts. The best-known example is the Tui Mine on Mount Te Aroha in the Waikato.
- *Timber treatment:* pentachlorophenol (PCP) was one of a number of chemical formulations used routinely at most sawmills and timber treatment plants from the 1950s until 1988, when its use ceased.
- *Sheep-dipping:* this involved the use of dichlorodiphenyltrichloroethane (DDT), arsenic and other chemicals to treat parasites on sheep in thousands of locations, usually on sheep farms but also in stockyards and railway sidings.

Many of these activities, such as the use of DDT in sheep-dips and to kill insects, were not known to be hazardous at the time.

It is uncertain exactly how many sites in New Zealand are affected by contaminants. Information collected by regional and unitary councils provides an indication of the number of sites identified so far. A 2008 survey by Statistics New Zealand[6] of 11 regional councils identified 1895 sites confirmed as "contaminated land" under the RMA. Of these sites:

[6] *Measuring New Zealand's Progress Using a Sustainable Development Approach*.

- 669 have been remediated
- 754 are under management to ensure the on-site contamination does not significantly affect the environment
- 472 remain to be cleaned up or managed.

Most timber treatment sites, gasworks and tailing dams are likely to be already identified and managed. However, there are many potentially contaminated sites which have been identified but not yet assessed. From information collected by regional and unitary councils the Ministry estimates councils have identified approximately 20,000 potentially affected sites.[7]

There are also likely to be many sites still unidentified. For example, the Ministry estimates there are thousands of sheep-dip sites distributed across New Zealand (Ministry for the Environment, 2006b). Their number, location and how contaminated they are remain largely unknown.

2.2 Human-health effects

The effects on human health from exposure to contaminants can be categorised into short-term (acute) and long-term (chronic) effects.

- *Acute toxic effects* can result in immediate adverse health impacts. For example, acute arsenic poisoning has the potential to occur when children ingest soil contaminated with high levels of arsenic associated with old sheep-dip or timber treatment sites.
- *Chronic effects* are adverse health effects that can result from an ongoing but low-level chemical exposure over an extended period. Carcinogenic (ie, cancer-causing) or developmental effects (eg, affecting organ function) may not be expressed to the extent of being able to be diagnosed until many years later.

The study of the dose–response relationship (cause and effect) of chemical poisoning is at the core of the branch of science called toxicology. People are exposed to a myriad of chemicals daily, mostly at levels that do not prevent the ability of the human body to function normally. Present-day assessments of safe exposure levels to chemicals are far more sophisticated than those that were available, say, 50 years ago. We now have the advantage of being able to use this knowledge to estimate the safe levels of chemical residues that exist in soil as contaminants from past activity, and to prevent or minimise exposure.

As well as endangering human health and the well-being of living organisms, the presence of contaminants can:

- limit the use of land
- cause corrosion that may affect buildings or other structures
- reduce land value.

[7] "Potentially affected" means those sites that have a history of a facility or activity that stored, used or disposed of hazardous substances.

2.3 Current controls over contaminated land

2.3.1 How contaminated land is managed

Current policy for managing land contamination includes a mix of laws and regulations, guidelines and funding arrangements. There are six main pieces of legislation that relate to contaminated land or the effects of contaminated land. These Acts can be grouped according to their relevance to contaminated land. The four main areas are:

- prevention of contamination
- contaminated land management, enforcement, remediation and liability (post-1991)
- protection of the environment (including human health) from the effects of contaminated land
- access to information about contaminated land.

An outline of the most relevant legislation is provided below.

2.3.2 Resource Management Act

The RMA provides for the sustainable management of natural and physical resources, and it is the core piece of environmental legislation for controlling the effects of contaminated land on the environment and people. The RMA contains a definition of contaminated land and defines functions for local government in relation to contaminated land. Contaminated land is defined in section 2 of the RMA as:

> Land that has hazardous substances[8] in or on it and
> (a) is more contaminated than an applicable NES, or
> (b) has, or is reasonably likely to have, significant adverse effects on the environment.

The RMA defines the environment widely to include ecosystems, people and communities, natural and physical resources, and amenity values.

Sections 30 and 31 of the RMA give local government the following functions:

- regional councils: "the investigation of land for the purposes of identifying and monitoring contaminated land"
- territorial authorities: "the prevention or mitigation of any adverse effects of the development, subdivision, or use of contaminated land".

These functions are generally interpreted as follows:

- regional councils identify and monitor contaminated land within their region. Most regional councils also collate and manage information about contaminants on land in a specific land-use information register
- when decisions are made concerning land-use changes or the subdivision or development of land, district and city councils are responsible for ensuring the potential for health effects of more sensitive use of land (eg, residential) are evaluated.

[8] The RMA section 2 definition of "hazardous substance" includes, but is not limited to, any substance defined in section 2 of the Hazardous Substances and New Organisms Act 1996 as a hazardous substance.

Section 43 of the RMA also specifically enables the use of an NES for the management of contaminated land. Section 43(1)(a)(iv) states that an NES can prescribe "soil quality in relation to the discharge of contaminants".

2.3.3 Health Act

The Health Act 1956 is the principal health statute. It is administered by the Ministry of Health and enforced by public health agencies and territorial authorities. The Act establishes public health management arrangements for communicable disease, and covers some generic environmental health risks and other miscellaneous issues.

The Health Act is relevant to contaminated land, in that it provides powers and sets a duty for territorial authorities to abate public health nuisances. Health nuisances are defined by the Act as conditions that are "offensive or likely to be injurious to health" (Health Act 1956, section 29[a] and [o]). Under section 23 of the Act, local authorities have a duty to:

> improve, promote, and protect public health within its district, and for that purpose every local authority is hereby empowered and directed—
>
> a) to appoint all such environmental health officers and other officers and servants as in its opinion are necessary for the proper discharge of its duties under this Act;
>
> b) to cause inspection of its district to be regularly made for the purpose of ascertaining if any nuisances, or any conditions likely to be injurious to health or offensive, exist in the district;
>
> c) if satisfied that any nuisance, or any condition likely to be injurious to health or offensive, exists in the district, to cause all proper steps to be taken to secure the abatement of the nuisance or the removal of the condition;
>
> d) subject to the direction of the Director-General, to enforce within its district the provisions of all regulations under this Act for the time being in force in that district;
>
> e) to make bylaws under and for the purposes of this Act or any other Act authorising the making of bylaws for the protection of public health;
>
> f) to furnish from time to time to the medical officer of Health such reports as to diseases, drinking water, and sanitary conditions within its district as the Director-General or the medical officer of health may require.

It is understood that the use of these powers for contaminated land is unusual and that they are only likely to be applied if there is a possibility of immediate harm.

2.3.4 Hazardous Substances and New Organisms Act

The Hazardous Substances and New Organisms Act 1996 (HSNO Act) and associated regulations are enforced by various agencies, including local government and the Department of Labour. HSNO controls are established to prevent future land contamination. Under the HSNO Act, life-cycle controls on the manufacture, use, storage and disposal of hazardous substances are set through regulations.

The HSNO Act provides for the Environmental Protection Authority to establish exposure limits for hazardous substances for the protection of human health and ecological receptors. An exposure limit is defined as the maximum amount of a hazardous substance that can be legally present in a particular environmental medium such as air, water or soil, or deposited on a plant surface (such as plant foliage), although exposure limits may also be set as guideline values (ie, they are not legally enforceable).

There are two types of exposure limits that may be set for hazardous substances.

- The *tolerable exposure limit* (TEL) is designed to protect humans from the adverse effects of toxic substances. It is the concentration of a substance in an environmental medium that will present a low risk of a toxic effect occurring in people exposed to that substance.
- The *environmental exposure limit* (EEL) is designed to protect organisms other than humans (including plants) from the adverse effects of ecotoxic substances. It is the concentration of a substance in an environmental medium that will present a low risk of adverse environmental effects in non-target areas.

TELs and EELs may be set for new toxic and ecotoxic substances that are assessed under the HSNO Act, and they may also be set for existing substances as they are transferred to the HSNO regime, as required by the Hazardous Substances Regulations (Classes 6, 8 and 9 Controls). Where a legally enforceable TEL or EEL has been set for a substance, it is an offence to use that substance in a way that causes the concentration to exceed the exposure limit set for that specific environmental medium.

2.3.5 Other relevant legislation

The **Food Act 1981** is implemented by the Ministry of Agriculture and Forestry (previously by the New Zealand Food Safety Authority) and local authorities. The Act enables the setting of food standards. Food Standards Australia New Zealand develops food standards for both New Zealand and Australia. In New Zealand, these standards are enforced by the New Zealand Food Safety Authority. It is important to consider food standards when setting soil quality targets for the remediation of land that will be used for food production, although there is no direct (or easily determined) link between food standards and soil contamination.

The **Building Act 2004** enables the setting of building regulations in the form of the Building Code. The Act is administered by the Department of Building and Housing and is implemented by territorial authorities. Clause F1 of the Building Code specifically requires building sites to be assessed to determine the presence and potential threat of any hazardous agents or contaminants. Clause F1 is supported by the *Approved Document for New Zealand Building Code: Hazardous Agents on Site* (Building Industry Authority, 2001). This provides a contaminated land investigation methodology derived from the now outdated *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* (ANZECC, 1992).

Also, under the Building Act an owner contemplating building work may apply to a territorial authority for a project information memorandum (PIM) in respect of the work. Like land information memoranda (see below), PIMs must include information on the likely presence of hazardous contaminants.

Under the **Local Government Official Information and Meetings Act 1987**, any person may apply in writing to a territorial authority for the issue of a land information memorandum (LIM) containing matters affecting any land in the district of that authority. Territorial authorities are required to disclose everything they know about a parcel of land, including any information they hold about the "likely presence of hazardous contaminants". LIMs have become an important mechanism for the release of contaminated land information. The interpretation of "likely presence of hazardous contaminants" has been clarified by Crown Law and the legal opinions have been released for the benefit of councils and landowners.

2.3.6 Funding through the Government's remediation fund

Since 2003, the Government has made up to $2 million a year available for the Contaminated Sites Remediation Fund (CSRF). The funding has been made available in two parts:

- $1 million per year is allocated to the clean up of New Zealand's highest-risk contaminated sites (eg, Mapua)
- $1 million per year is available as a contestable fund to assist regional councils to investigate and clean up high-risk contaminated sites; to qualify, the sites must pose a known or potential risk to human health and the environment within their regions.

The contestable portion of the fund is to be applied in those sites:

- that are assessed as posing or likely to pose a high risk to human health
- that are located in environmentally or culturally sensitive areas
- for which contributory funding is available from other sources (eg, local government, land owner/occupier).

The CSRF plays a key role in encouraging action on contaminated sites, especially where the responsibility for contamination is difficult to establish. The fund has supported many projects, most of which have been for assessment and remediation planning rather than actual remediation. The remediation of the former Fruitgrowers' Chemical Company property in Mapua, near Nelson, is the largest and most notable of these remediation projects. There are, however, obstacles to achieving clean up, such as the size of the fund and the limited financial resources of local government.

2.3.7 Guidance

The Ministry has led a work programme to address the risks from historical contamination and to build on the policy foundation established under ANZECC (1992). The result has been a series of contaminated land management guidelines (CLMGs), developed by the Ministry in consultation with industry and local government. These provide a theoretical framework to contaminated land management and support local government functions under the RMA. A number of industry-based guidelines have also been developed.

The CLMG series includes the following guidelines.

- *Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand* (Ministry for the Environment, 2003) provides guideline reporting forms and checklists.
- *Contaminated Land Management Guidelines No. 2: Hierarchy and Application in New Zealand of Environmental Guideline Values* (Ministry for the Environment, 2003) provides guidance on selecting criteria from domestic and international guidelines.
- *Contaminated Land Management Guidelines No. 3: Risk Screening System* (Ministry for the Environment, 2004) provides a system for doing a desktop risk screening of contaminated land.
- *Contaminated Land Management Guidelines No. 4: Classification and Information Management Protocols* (Ministry for the Environment, 2006) outlines a consistent method for local government registers and the release of information through relevant legislation (eg, LIMs through the Local Government Official Information and Meetings Act 1987 and PIMs through the Building Act).

- *Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils* (Ministry for the Environment, 2004) provides best practice guidance for practitioners and local authorities for the sampling and analysis of soils on sites where hazardous substances are present or suspected in soils, along with guidance on the principles governing the interpretation of the data obtained.

In the process of developing the CLMGs, and in particular Guidelines 1, 4 and 5, the Hazardous Activities and Industries List (HAIL) was compiled, updated and published.[9] HAIL is a compilation of activities and industries that are considered likely to cause land contamination resulting from hazardous substance use, storage or disposal. It is a revision of the list of industrial activities first published in the ANZECC (1992) guidelines. HAIL is intended to identify most situations in New Zealand where hazardous substances could cause, and in many cases have caused, land contamination. It is used to ensure consistent reporting on site history and for identifying sites for inclusion on local government registers.

In some cases, a generic activity involving hazardous substances is listed, irrespective of the industry (eg, petroleum storage). In other cases, an industry is listed on the basis that certain activities typical of that industry involve the storage, use or disposal of hazardous substances, and therefore all sites within that industry should be considered (eg, the timber treatment industry). In other cases, particular activities are a small part of a particular industry, with the activity generally localised within larger sites. For example, animal dip sites are listed but farming is not, because dip sites are only a small part of a farm, and farming in general does not have a high potential to be contaminating over the whole farm. Guidelines 1, 2 and 5, and HAIL, are incorporated by reference into the NES.

Industry-based guidelines published include the following.

- *Health and Environmental Guidelines for Selected Timber Treatment Chemicals* (Ministry for the Environment and Ministry of Health, 1997) provides guidance on the assessment and management of timber treatment sites, including numerical values for selected timber treatment chemicals. As the first New Zealand contaminated land management guideline, this document also provides generic guidance on sampling strategies and investigation techniques that could be– and in practice have been − applied to all contaminated site types. This guideline has also, by presenting guideline derivation equations and exposure definitions, provided the generic approach that practitioners have used to derive guideline values for other substances or for site-specific situations.
- *Guidelines for Assessing and Managing Contaminated Gasworks Sites in New Zealand* (Ministry for the Environment, 1997) includes numerical values for hazardous substances associated with gasworks sites.
- *Draft Sampling Protocols and Analytical Methods for Determining Petroleum Products in Soil and Water* (Ministry for the Environment, 1999).
- *Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand* (Ministry for the Environment 1999) includes guidance on site investigation and sampling; physical and chemical factors important when assessing petroleum hydrocarbon contamination; principles of health and environmental risk assessment and generic soil acceptance criteria for a Tier 1 assessment process; and information for developing site-specific criteria used as part of a Tier 2 assessment.

[9] HAIL is available on the Ministry website: http://www.mfe.govt.nz/issues/hazardous/contaminated/hazardous-activities-industries-list.html

- *Identifying, Investigating and Managing Risks Associated with Former Sheep-dip Sites: A Guide for Local Authorities* (Ministry for the Environment, 2006) provides guidance to help local authorities address the potential risks arising from contaminated sheep-dip sites.

In 2011, the Ministry published two key documents as technical reference in support of the development of the NES. (The second document is also incorporated by reference into the NES.)

- *Toxicological Intake Values for Priority Contaminants in Soil* (Ministry for the Environment, 2011) presents recommendations for toxicological intake values for 12 priority contaminants in soil. Toxicological intake values describe the concentration at which substances might pose no appreciable risk, or minimal risk, to human health. This document is a technical reference in support of the *Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health* (see below). It presents a review of the toxicology literature and recommendations for toxicological criteria for priority contaminants in soil. The term "soil contaminant standards" to protect human health, or "SCSs ($_{health}$)", specifically refers to soil contaminant concentrations that are mandatory under the NES. The values in the report were endorsed by the Ministry's Toxicology Advisory Group.
- *Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health* (Ministry for the Environment, 2011): as an alternative to adopting standards from another country, this report examined the science of risk assessment and compiled a derivation methodology for health-based standards to apply to soil contaminants in New Zealand under the RMA. The methodology in this document is government policy and has two applications. First, it demonstrates how the standards for contaminants in soil were derived for use within the NES regulation as "soil contaminant standards", SCSs (health). Second, it sets out the basis for deriving soil contaminant concentrations protective of human health for exposure scenarios that lie outside the generic exposure scenarios under the NES. The report includes a suite of numerical criteria for priority contaminants that are legally binding as part of the NES.

The following guidelines are also widely used to assess the effects of hazardous substances on air, surface water and sediment:

- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC and ARMCANZ, 2000)
- *Ambient Air Quality Guidelines* (Ministry for the Environment, 2002).

All of the above guidelines are widely used in New Zealand, at least by regional councils and unitary authorities. A June 2006 survey of regional council officers revealed the contaminated land management series was used by 85–100 per cent of respondents, while the main industry guidelines were used by 79–83 per cent of respondents (Ministry for the Environment, 2006c). Although the level of use by territorial authorities has not been surveyed, it is likely to be much more variable due to the history of regional councils' focus on contaminated land matters and territorial authorities having no similar or consistent focus. The most recent guideline to be published in the contaminated land management series (guideline no. 4) has more direct relevance for territorial authorities.

2.3.8 Current planning controls

Each council controls the activities in its area through policies and rules in district and regional plans. Resource consents may be required for changes in land use or other activities on

contaminated land, and/or for activities that have the potential to contaminate land. Because each plan is prepared individually, there is a lot of variability between plans in terms of how they address contaminated land. A 2006 review of contaminated land provisions in district, regional and unitary plans highlighted the extent of this variability.[10] The review showed that:

- 33 per cent of district plans featured no provisions relating to contaminated land
- 18 district and two unitary plans contained rules, but only 14 plans contained rules specifically addressing territorial authority functions under section 31 for the RMA
- of the plans that included issues, objectives, policies and methods, there was significant variability in how contaminated land was addressed.

Regional and unitary plans are more consistent in that most address contaminated land in their plans, with 88 per cent (14 plans) having issues, objectives, policies and methods. Of those plans, 10 include rules relating to the use and/or remediation and/or discharge from contaminated sites or land. However, there is still significant variation in terms of how each plan addresses contaminated land.

The lack of specificity in the controls of many district plans may result in an ad hoc process of identifying, assessing and cleaning up or containing the contaminants. An ad hoc process has much greater risk of:

- affected sites not being identified at the time of development, and therefore any human health risk not being assessed
- identified sites being inadequately assessed because of the use of inappropriate methods for investigating and assessing soil contaminants
- remediation or containment being inadequately undertaken or controlled.

These outcomes may put people's health at risk, provoke community concern, initiate expensive post-development disputes or require expensive post-development remediation to correct the problem.

2.3.9 Use of soil contaminant values

The application of different soil contaminant values across various districts in New Zealand creates uncertainty for developers and industries and increases the potential for legal disputes between landowners and councils. Councils or contracted consultants often select guideline values from international literature, which may not be entirely appropriate for New Zealand circumstances. Some councils have derived their own guideline values, but there is a lack of consistency in the values.

Thirteen of the district plans that contain specific contaminated land rules still reference ANZECC, 1992, which contains old and, in many cases, superseded guideline values. There are also some inconsistencies in the methodology used to derive guideline values between the different national guidelines due to their differing specific purpose. Many guideline values that were derived in the 1990s are not based on the most recent scientific data.

The Ministry for the Environment has produced guidance (Ministry for the Environment, 2003) that helps practitioners select and apply environmental guideline values.

[10] Unpublished report for the Ministry for the Environment, 2006.

However, implementation of this guideline has not been consistent and has resulted in uncertainty, such as:

- an over-assessment of risk, resulting in un-required or more expensive clean-up or containment of contaminants
- an under-assessment of risk, resulting in an unacceptable level of risk to human health
- expensive disputes over the most appropriate value to apply.

2.4 Summary of the issues and gaps in current controls

The past use of chemicals (hazardous substances) in industry, agriculture and horticulture has left a legacy of soil contamination in New Zealand. Properties potentially affected by soil contamination cannot be assumed to be safe for use unless they have been subjected to a process of:

1. identifying or confirming that the land is affected or potentially affected by contaminants in soil
2. assessing the risk of adverse effects posed by contaminants using appropriate soil contaminant thresholds
3. requiring the clean-up or containment of soil contamination, if necessary, to minimise the risk of adverse effects occurring.

The RMA provides the means of managing properties potentially affected by soil contamination. Guidance on management under the RMA is comprehensive and has been widely used, but to be fully effective it needs to be applied consistently and appropriately to ensure people's health is not placed at risk.

However, the broad suite of current controls over contaminated land does not address two important and practical gaps:

- absent, inadequate and inconsistent controls on land use, subdivision and the development of affected and potentially affected land – of 73 district plan sets assessed for the Ministry, only 14 had rules that specifically addressed their contaminated land function under the RMA[11]
- inconsistent and inappropriate use of guideline or contaminant values to assess the effects of affected and potentially affected land – the use of guidelines among practitioners and councils is presently inconsistent and variable, and this is resulting in different soil contaminant values being applied.

These two gaps have resulted in ad hoc approaches to identifying, assessing and cleaning up or containing contaminants, and consequently there is risk of inappropriate development of land. This has the potential to:

- put people's health at risk
- provoke community concern
- initiate expensive post-development disputes and remediation or containment to correct.

[11] Under section 31(1)(b)(iia) of the RMA, district councils have responsibility for "the prevention or mitigation of any adverse effects of the development, subdivision, or use of contaminated land."

3. The Options

3.1 Policy objective

The policy objective is:

> Ensuring that land affected by contaminants in soil is appropriately identified and assessed at the time of being developed and if necessary remediated, or the contaminants contained, to make the land safe for human use.

The overall goal is not to instigate a search for all land in New Zealand that could be contaminated. It is to ensure councils assess only land that is associated with a HAIL listing, based either on information held by or accessible to the relevant territorial authority, or on a preliminary site investigation. The priority is protecting people as opposed to the wider environment. Some plants and animals are more sensitive to certain contaminants than humans. However, it is important to realise the soil affected by contaminants has already been compromised, and so the imperative is not to restore the soil to its original condition but to ensure it is at least safe for human use.

For the purposes of this objective:

- "appropriately" means consistently, efficiently and adequately− a consistent and adequate process is desirable to ensure a minimum level of health protection for all New Zealanders, and the process needs to be efficient to ensure land made safe for human use does not unnecessarily constrain the safe use of land, implementation is timely and administration costs are minimised
- "assessed" includes the appropriate use of soil contaminant thresholds protective of human health
- "developed" includes soil disturbance, subdivision and land-use change
- "safe for human use" is not intended to diminish the importance of other aspects of the environment, but to emphasise that protecting human health is the primary concern when assessing land-use and exposure scenarios.

3.2 Legislative and policy context

The assessment and management of contaminated land are affected by a range of legislation, regulation and policy, as outlined in section 2 above. The primary issue identified in this section is the lack of, or inconsistency in, planning controls to make certain that the process of identification, assessment and remediation at the land development stage ensures land is safe for human use. To address the identified gap in nationally consistent methods and planning responses, the RMA is the primary means of legislative response.

3.3 Evaluation of the policy objective under the RMA

Section 32(3)(a) requires the evaluation examine the extent to which the policy objective is the most appropriate way to achieve the purpose of the RMA. Section 32 is set out in full in Appendix B. There are two main aspects to the test of appropriateness:

- weighing up alternative objectives to determine which one will provide environmental outcomes that will best meet the purpose of the RMA
- being satisfied the objective chosen can best be achieved through the RMA rather than through some other mechanism.

The purpose of the RMA is to promote the sustainable management of natural and physical resources, which means:

> ... managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while –
>
> a. sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
>
> b. safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
>
> c. avoiding, remedying, or mitigating any adverse effects of activities on the environment.

Based on the evaluation included in the following sections, it is considered the objective represents the most appropriate way to achieve the purpose of the RMA. Broadly, it is considered the objective appropriately reflects the balance incorporated in the Act's purpose between enabling the use and development of resources, avoiding, remedying or mitigating the adverse environmental effects of this use and development, and enabling the health and safety of people and communities.

The NES will enable safe and economic use, meeting the purpose of the Act by ensuring:

- all district planning controls are appropriate and nationally consistent
- the soil contaminant values protective of human health are appropriate and applied consistently
- councils are better able to gather and apply the information needed for efficient decision-making on affected or potentially affected land.

3.4 Resource Management Act options

The Minister for the Environment has considered and evaluated a range of options for addressing the problems identified with the status quo. These are:

- status quo / non-regulatory national guidance
- amend the RMA
- develop a national policy statement under the RMA
- direct plan changes under the RMA
- develop a national environmental standard under the RMA.

The following criteria are used to assess the suitability of each of the identified options.

A. Provide certainty of policy content. The solution should give councils certainty as to the detail of the policy content (eg, providing specific plan rules and contaminant thresholds). This should result in fewer application and dispute costs for councils, landowners and industry with regard to the resource consent process.

B. Create administrative efficiency. The solution should be implemented with minimal administration and compliance costs and avoid a lengthy and uncertain transition period. The solution should also enable an efficient planning process. For example, the solution should avoid requiring every council to develop and litigate its own planning controls relating to contaminated land.

C. Promote national consistency. The solution should promote the consistent identification, assessment and remediation of contaminated land across all territorial authorities in New Zealand. National consistency is particularly desirable for setting human-health thresholds that apply equally to every New Zealander.

3.4.1 Status quo / non-regulatory guidelines

The status quo option involves continuing with national guidelines. National guidelines have been the main mechanism used by the Ministry for the Environment to guide and support contaminated land practitioners in industry and local government. An overarching guideline for contaminated land that consolidates other guidelines is likely, in itself, to improve contaminated land management. A national guideline is easy to update and would help improve practice by:

- providing a one-stop reference on the derivation, appropriate selection and use of health-based numerical values
- explaining how numerical values can be tailored to New Zealand land-use settings (eg, a lifestyle block)
- increasing national consistency in how contaminants in soil are assessed and managed.

Although credible guidelines are generally used by local government and practitioners, the review of district and regional plans discussed above found the guidelines have not achieved a consistent, adequate and efficient approach. This is because:

- guidelines are voluntary and councils are not required to implement them
- councils may vary from the prescribed approach – some councils are likely to choose to adopt alternative approaches to those prescribed
- the transition to a guideline approach may be lengthy – for example, because of the district planning cycle there may be a lengthy transition time between the publishing and the uptake of the guideline, and the situation is further complicated by the fact that plans that reference previous guidelines would need to be changed for guidelines to have full effect in those areas
- the transition to a guideline approach is administratively inefficient – under the guideline approach each council would need to change its plan, which is likely to result in duplication of effort by councils and submitters and provide the opportunity for the serial re-litigation of proposed plan changes.

For the above reasons a non-regulatory guideline approach is not the most appropriate method for achieving the objective.

3.4.2 RMA amendment

There are two main ways the RMA could be amended to address the identified issues:

- change contaminated land "functions" in sections 30 and 31 to "duties"
- introduce more specific requirements for assessing contaminants in soil.

The RMA already has functions that broadly specify the roles of regional councils and territorial authorities in relation to contaminated land. However, these provisions have been criticised by stakeholders (Ministry for the Environment, 2007b) for not being strong enough to compel councils to undertake these functions.

Elevating functions to duties to compel councils to act on them is likely to result in improvement in how councils give effect to their current functions. The advantage of this approach is that a higher priority than that presently given to soil contamination is likely. A higher priority may improve the resourcing applied to addressing soil contamination, which may include the initiation of plan changes to introduce appropriate provisions.

However, because of the broad nature of the RMA and existing functions, these changes are open to interpretation. They would still leave the exact form, content and choice of rules and supporting technical methods to give effect to the duties to the discretion of individual councils. Therefore, these changes would still lead to regulatory inconsistency between councils as they individually interpret and incorporate the RMA duties into plans and consent decisions.

The RMA could be amended to be more specific about assessing contaminants in soil, such as defining contaminant values, technical methods and requiring that district plan controls ensure the appropriate identification, assessment and (if necessary) clean-up or containment of contaminated soils. The advantage of amending the RMA is that it would provide a clear, unambiguous legal obligation. However, this option would be contrary to the existing RMA framework, which generally sets out broad processes and principles rather than prescribing matters of technical detail. It would also require significant amendments to be made to the RMA, and amendments each time a soil contaminant value is revised.

These options implemented either together or by themselves are not considered to be the most appropriate means of achieving the policy objective because of their inability to ensure an adequate or consistent process.

3.4.3 National policy statement

A national policy statement (NPS) with specific objectives and policies on soil contamination has the potential to provide considerable improvements to how soil contamination is addressed by councils. An NPS contains objectives and policies on matters of national significance that must be "given effect to" in RMA planning documents and given "particular regard to" in resource consent decision-making. An NPS provides a potentially useful means by which national policy can be implemented through local and regional decision-making.

An NPS may be prepared on any matter where the Minister considers it useful to state matters of national significance that are relevant to achieving the purpose of the RMA. The RMA sets out a range of matters the Minister may have regard to when deciding whether it is desirable to prepare an NPS. These matters are broad, and the proposed objective would fit within the broad criteria for an NPS.

However, an NPS can only set policy. The detail of specific rules or methods of implementing the stated policies is up to local authorities. Leaving the exact form, content and choice of technical methods to achieve the policy outcome to the discretion of individual councils would not achieve regulatory consistency between councils as they individually interpret and incorporate the NPS into plans.

An NPS may, over time, achieve the objective. However, it is not the most appropriate way of achieving the objective because of the high-level nature and uncertainty of interpretation and implementation of such a policy statement.

3.4.4 Minister-directed plan change

Section 25A of the RMA enables the Minister to direct a territorial authority to prepare a change to its district plan or proposed district plan that addresses a resource management issue relating to its function under section 31. The control of the actual or potential effect of soil contaminants is a resource management issue relating to a council's section 31 functions.

This option would have the advantage of requiring district and city councils to specifically address how they control the effects of contaminated land. The outcome of these plan changes is likely to be considerable improvements to how soil contamination is addressed by councils.

However, this option has two main disadvantages.

- It does not ensure appropriate or consistent controls: it is likely the Minister would need to direct that changes be made to more than 50 plans due to the current state of plans. All directed plans would still be required to go through the Schedule 1 process.[12] Even if the Minister was very specific about the issues to be addressed, the directions may be interpreted and drafted differently by each council. In addition, the process of consulting, hearing and addressing appeals may introduce further inconsistencies.
- It is administratively inefficient: more than 50 plan changes being required to go through the Schedule 1 process at the same time is likely to be expensive and demanding on the already limited capacity of soil contamination experts, planning experts and those stakeholders with a national interest in this issue (eg, the oil industry and agricultural sectors).

For the above reasons, this approach is not considered the most appropriate way of achieving the objective.

[12] Schedule 1, Part 1, of the RMA sets out the requirements relating to preparing and changing policy statements and plans, including consultation, notification, disputes resolution, hearings and appeals.

3.4.5 National environmental standard

A national environmental standard (NES) is a regulation that can control activities directly and independently of regional or district rules. An NES may also prescribe the way local authorities manage activities and resources, including classifying activities, prescribing methods or monitoring requirements, and similar matters of regulatory practice. An NES therefore generally has three advantages over other options in that it can:

- take effect immediately rather than having to be applied through plan changes (a process that can take some years)
- more directly remove decision-making discretion from local authorities and provide for greater certainty of achieving the desired objective (especially in terms of matters relating to resource consents)
- prescribe the level of detail necessary to ensure an adequate and consistent approach.

3.5 Comparison of alternative options

Table 1 provides an assessment[13] of each of the identified options against the three criteria used to assess suitability: (A) certainty of policy content, (B) administrative efficiency and (C) promotion of national consistency.

Table 1: Summary assessment of policy options

Policy option	Criterion A: Certainty of policy content	Criterion B: Administrative efficiency	Criterion C: Promotion of national consistency
Status quo including national guidelines	✓	✓	×
Amend RMA			
Change contaminated land function to a duty	×	×	×
More specific requirements for assessing and managing soil contaminants	✓	×	×
Minister-directed plan change to insert rules and soil contaminant values	×	×	×
National policy statement to provide specific objectives and policies	×	✓	×
NES to provide specific rules, methods and soil contaminant values	✓	✓	✓

Based on assessment against the criteria, the options considered most suitable to achieve the stated objective are national guidelines and national environmental standards. However, the NES provides important additional benefits over all the other options. An NES:

- mandates immediate and consistent use by overwriting conflicting guidelines and local government plans (consistency and efficiency)
- avoids the sometimes lengthy and uncertain transition normally associated with the implementation of the other approaches (efficiency)
- creates administrative efficiencies by preventing serial re-litigation of plans and resource consents (efficiency)

[13] Minister for the Environment, 2011.

- ensures its requirements are implemented because any requirements are legally binding on local government (adequacy).

These additional benefits over a guideline approach and the other options are considered particularly desirable for setting human-health thresholds, where consistency and certainty are very important.

4. Proposed National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

4.1 Introduction

The NES will require local authorities to control the use of land affected by contaminants, and will therefore enable use to be made of affected land by ensuring:

- district planning controls are appropriate and nationally consistent
- councils gather and apply the information needed for efficient decision-making on contaminated or potentially contaminated land
- the soil contaminant values are appropriate and applied consistently.

The NES will achieve this by setting out a framework of resource consent requirements for the use of affected land. It would capture both land that is potentially contaminated and land that is contaminated by applying to any land that:

- has had, or has an activity or industry on the Hazardous Industries and Activities List (HAIL) on it or
- is more likely than not to have had such an activity or industry on it.

The NES would allow two methods for identifying whether land fell into this category. The first would be by using the most up-to-date information held by the relevant local authorities in the area, for example, information held on their databases and registers about whether land is HAIL land. The second would be by relying on a preliminary site investigation report certified by a suitably qualified and experienced practitioner that the land is not HAIL land or that it is more likely than not to fall into this category.

Activities are classified either as permitted activities (subject to terms and conditions to control effects), controlled activities, restricted discretionary activities and discretionary activities

It is intended the NES controls would apply to land-use change, subdivision and disturbance of land where there has been a facility on the land or a hazardous activity carried out on the land which may have involved the intentional or accidental discharges of hazardous substances that could now be a risk to human health.

Full details of the permitted, controlled and restricted discretionary activities and their terms and conditions are attached in Appendix A.

4.2 Permitted activities

The NES would specify that the following activities are permitted provided they meet stated terms and conditions to ensure there are no significant adverse effects:

- the removal or replacement of fuel storage systems, impacted soil, and associated activities (such as soil sampling)
- small-scale (no greater than 25 cubic metres per 500 square metres of affected land) and temporary (two months' duration) soil disturbance activities
- sampling activities.

The NES would also specify that subdividing land and changing land use is permitted where it is highly unlikely that the proposed new use will pose a risk to human health.

4.3 Controlled activities

The following activity would be specified as controlled:

- the development of land where soil is, or is likely to be, contaminated, but where contaminants do not exceed the soil contaminant value for the intended land use.

4.4 Restricted discretionary activity

The following activity would be specified as restricted discretionary:

- the development of land where the risk to human health from soil contamination exceeds the soil contaminant value for the intended land use.

4.5 Discretionary activity

The following activity would be specified as discretionary:

- the development of land which does not meet the requirements to be a permitted, controlled or restricted discretionary activity.

4.6 Consultation

4.6.1 Submissions received

One hundred and six submissions were received on the proposed NES discussion document, including 42 from local government and 33 from industry. The majority of submitters either supported (13 per cent) or conditionally supported (55 per cent) the proposal. Regardless of their position over other details of the proposal, most submitters agreed or conditionally agreed (77 per cent) that an NES is the most appropriate instrument to achieve the objective. An overview of submissions is included in Appendix C.

Key issues raised by submitters were that the NES should:

- contain a straightforward planning framework, with provisions that are clearly stated and easy to implement
- not undermine the importance of ecological assessment
- not impose costs on local government that should be met by the developer
- be supported by guidance for territorial authorities on how to implement the NES.

4.6.2 Response to submissions

A group of departmental toxicologists and a group of practitioners, including local government and industry representatives, helped the Ministry to consider submissions and make revisions to the proposed planning controls and the supporting soil contaminant values. The revisions make the proposed planning controls more efficient and easier for local government to implement. Post-consultation revisions include:

- inclusion of methods to determine whether land is land to which the NES applies
- simplifying and streamlining the detail of the proposed planning controls and identifying the need for clarity in defining certain terms
- amending a permitted activity[14] (no consent required) to a controlled activity (consent required) to enable thorough review of detailed investigation reports and to make it easier for local government to recover the cost of reviewing these reports from developers
- providing for a permitted activity (no consent required) to enable change of use or subdivision of land without the need for a resource consent where a preliminary investigation shows it is highly unlikely that the proposed new use will pose a risk to human health
- providing for a discretionary activity where an activity does not meet the necessary requirements to be a permitted, controlled or restricted discretionary activity.

Soil contaminant values have generally been reduced from the values proposed in the discussion document. The following key revisions were made in response to technical submissions and in response to recent and international toxicological decisions:

- a general reduction of all soil contaminant values, resulting from changes to assumptions on child exposure (body weight and soil ingestion)
- the inclusion of a rural/lifestyle scenario within the NES, which assumes that the home garden supplies 25 per cent of the produce consumed by the household
- reductions in soil contaminant values for cadmium, benzo(a)pyrene and lead, based on the most recent scientific and toxicological advice.

[14] Development where the risk to human health does not exceed the soil contaminant value for the intended land use.

5. Efficiency and Effectiveness of the National Environmental Standard

5.1 Measuring efficiency and effectiveness

Section 32(3)(b) requires the evaluation must examine whether, having regard to its efficiency and effectiveness, the NES is the most appropriate way of achieving the objective. Section 32 is set out in full in Appendix B.

Getting a measure of *effectiveness* involves assessing how well a given mechanism or tool might work. The relative *efficiency* of different alternatives is more difficult to determine and involves examining costs and benefits. A measure of efficiency is the extent to which the proposed method achieves the purpose of the Act compared to the magnitude of what is foregone as a result of using this method. Such an assessment involves calculating and comparing the net benefits against the net costs (environmental, social and economic). The higher the benefit-to-cost ratio, the more efficient the option is. This, however, assumes that benefits and costs can be quantified in monetary terms. It is also important to identify 'intangible' considerations so they can be included in the broader consideration of the efficiency and effectiveness of the NES.

Within this framework, the measure of efficiency will generally consider the NES package as a whole rather than breaking it down into its individual parts.

5.2 Approach to measuring costs and benefits of adopting the NES

The cost–benefit analysis undertaken in the Covec report (Covec, 2010) compares the expected impacts of the NES with a likely scenario without the NES. In this latter scenario, the contamination standards and planning controls contained within the NES are published by the Ministry as guidelines only. Section 3 above contains more detail on the assessment of options. (The publication of guidelines is the status quo option.)

This cost–benefit analysis indicates the national estimated costs of the NES could be $6 to $7 million, with the estimated benefits around $4.5 to $10 million over the next 20 years. These estimates are based on assuming that:

- the estimated amount of contaminated land affected by the NES would be around 100 hectares
- the NES could prevent an estimated 1685 individuals from being exposed to harmful contamination.

The impacts of the NES would vary across the country, with contamination rules and standards stricter in areas where councils currently have no such rules or standards and are unlikely to introduce any. Where councils have already implemented contaminated land rules and standards, the NES could result in standards that are comparable or more lenient for some contaminants.

The Covec study found it difficult to obtain useful data for the analysis, which resulted in a high degree of uncertainty regarding the impact of the NES. The report noted in particular that:

> little is known about a number of variables that could have a significant impact on the magnitude of additional remediation costs and public health benefits that may be generated by the NES over the next 20 years. The major areas of uncertainty relate to the amount of contaminated land that would be affected by the NES, how it would otherwise be dealt with and how the NES could alter the risks of illness to residents of such sites. Specifically, it is difficult to predict:
>
> - the total area of land developed for residential use in the future that may potentially be contaminated because of previous use and where this land is located;
> - the area of this potentially contaminated land that would be identified as such by councils and investigated for actual contamination in the absence of the NES;
> - the proportion of land area with levels of contaminants that exceed the soil guideline values specified in the NES, as well as the specific contaminants and the actual levels at which they are present;
> - whether any contamination would be addressed by remediation or some other, potentially less costly, approach (eg altering the location of buildings);
> - the approach or method the landowner would choose to manage the risk on his land (clean-up often more costly than containing the contaminants on site);
> - the level of risk that residents would face if they were exposed to the contamination currently present on this land; and
> - the number of individuals that would subsequently develop illnesses because of exposure to this contamination, what these illnesses would be, when they would occur, and whether these illnesses would be fatal. (Covec, 2010, p iii)

5.3 Costs and benefits

5.3.1 Administrative costs and benefits

There will be administrative costs and savings to councils and other parties associated with the introduction of the NES. The potential costs are outlined in the following table.

Table 2: Potential impacts for an individual council

Potential impact	Possible magnitude
Contaminated land information system upgrade	$10–20,000, up to $100,000
Avoided plan change costs	$15–20,000, up to $125,000
Avoid consent application disputes	up to $100,000 per dispute
Avoided contamination response costs	$100,000 per incident
Avoided post-development disputes	$20–60,000, up to $100,000 per dispute
Avoided post-development remediation	$100,000 per site

Source: Covec, 2010, table 10, p 41.

Avoided plan change costs

The NES would remove the need for councils to make plan changes and introduce their own contaminated land rules and standards, thereby reducing administrative costs. According to the Covec report, if the NES were not introduced, 40 to 50 councils would be likely to implement

their own contaminated land rules. Only 14 district plans have specific rules relating to contaminated land. Many of the other districts are likely to establish their own rules in the absence of the NES due to increased awareness of this issue and their specific RMA function.

Introducing the NES will ensure the administrative costs associated with engaging technical expertise, internal staff time, facilitating and reviewing public consultation (including advertising public notices), and engaging commissioners for hearings can be avoided. Preliminary discussions with industry participants and councils that have implemented specific contaminated land rules indicate these costs could be in the vicinity of $15,000–$20,000 per council, and up to $100,000 if the plan change is appealed and resolved in the Environment Court.

Up to three councils[15] may also develop specific soil contamination standards in response to development pressures to provide additional certainty to landowners and developers. For such councils, additional costs associated with technical expertise and staff could be in the order of $150,000.

Reduced response to disputes

The Covec report indicated (p 36) that a reduction in inappropriate development could also reduce the costs associated with responding to unexpected contamination incidents. Addressing these incidents and dealing with dissatisfied individuals or groups can use up a significant amount of council time and resources. For example, an incident similar to the recent discovery of potentially dangerous contamination at Marfell Park in New Plymouth could generate up to $100,000 in council-related costs, many of them related to communications and media. These costs are in addition to direct site investigation costs.

Consequently, if the NES eradicated two disputes per year, the value of the dispute costs that could be avoided over the next 20 years would be in the order of $500,000 to $1 million.

Reduced administrative costs for central government

Central government would have a reduced risk of having to cover potential costs related to responding to contamination incidents. The costs of this can range greatly, and could potentially be around $400,000 to $2 million (Covec, 2010, p 42).

Avoided submission costs

The process of establishing rules or amending district plans results in interested parties making submissions and becoming involved in the consultation process within each district. It is likely that a number of private parties would be involved in these consultation processes, ranging from local individuals to large national organisations. The introduction of the NES would eliminate the need for consultation and submissions across the country in every district that alters or introduces contaminated land rules in its district plans.

The Covec report estimates that the total cost of private submissions that could be avoided via the introduction of the NES at between $1 million and $1.5 million. This estimate is based on an assumption that without the NES around 40 to 50 councils would amend the contaminated land

[15] This estimate is based on the number of councils that have already developed local soil contaminant values over the past five years.

provisions over the next five to 10 years, and that each proposed change attracts an average of 10 small (local) submitters and four large (national) submitters, each with up to five proposed changes appealed to the Environment Court.

Reduced resource consent costs

The NES may increase the number of developments requiring resource consent and therefore increase compliance costs for landowners. However, if resource consent is required, the NES provides greater certainty regarding the standards applying and so would result in fewer administrative, compliance and dispute costs associated with obtaining resource consent to subdivide, develop or change the land use of affected land. The Covec report estimated the resource consent costs avoided from the NES could be in the vicinity of $1 million to $2 million over the next 20 years (p 28).

5.3.2 Compliance costs for landowners

There will be both increased and avoided (reduced) compliance costs to landowners associated with the introduction of the NES. Those potential costs are outlined in the following table.

Table 3: Potential impacts for landowners

Potential impact	Possible magnitude
Increased application and investigation costs	$10–20,000, up to $100,000
Increased remediation costs	Variable, from minor to up to $200,000 per site
Avoided consent application disputes	$10–20,000, up to $100,000 per dispute
Avoided tank pull consent costs	$5–10,000 per site
Avoided post-development disputes	$20–60,000, up to $100,000 per dispute
Avoided post-development remediation	$100,000 per site
Avoided Plan change submission costs	$1–5,000, up to $100,000

Source: Covec, 2010, table 11, p 41.

In areas that would not otherwise have rules or standards similar to those in the NES, its implementation has the potential to result in new, additional costs being imposed on landowners who seek to develop affected sites. These costs can be categorised as:

- investigation costs – the costs of investigating sites for contamination to determine if resource consents are required
- application costs – the costs of obtaining resource consent to develop affected land
- remediation costs – the costs of treating contaminated land.

This could lead to landowners:

- avoiding high remediation costs brought about by soil excavation and disposal by using other methods to reduce the risk of exposure to contaminants (eg, a capping or containment option, in conjunction with a site-specific [Tier 2], human-health risk assessment and resource consents for any ongoing management)
- deciding not to develop the land and continue using it for existing uses, because increased remediation costs make development unviable

- deciding to develop the land in the same manner as they would have in the absence of the NES, despite having to incur higher costs for remediation (Covec, 2010, p 7).

5.3.3 Remediation costs

For a large number of the sites that could be developed for residential use in the future, the implementation of the NES would not be expected to have any material impact on remediation costs. This is because, if the soil contaminant values contained in the NES become widely used as public guidelines, the extent of remediation carried out for many sites would be the same whether or not the NES is formally introduced, and because the majority of future residential development is expected to occur in areas where there would be rules regarding the development of potentially contaminated land.

However, the NES is likely to have an impact on the number of sites identified as contaminated, and therefore where some level of risk management is required. The NES is most likely to increase remediation costs for some sites in areas where no specific contaminated land rules are likely. The Covec report estimates (p 8) that an additional 100 contaminated sites would be remediated over the next 20 years as a result of the NES.

The NES may not affect the cost of some options for dealing with certain types of contaminated land; for example, carrying out a 'cap and contain' approach, along with an associated Tier 2 human-health risk assessment to derive site-specific acceptance criteria. The costs of this approach to re-developing a former industrial site may be the same with or without the NES. Consequently, whether remediation costs would be affected by the NES depends on a number of site-specific characteristics (Covec, 2010, p 15).

The approximate scale of these remediation costs for the different site types will vary under different possible scenarios:

1. no NES and no specific contaminated land rules
2. no NES, and new guideline values from the NES are not adopted (ie, the old guidelines continue to apply)
3. no NES and new guideline values from the NES are adopted
4. the NES is implemented.

If the NES were not introduced, but instead its soil contaminant values were published as guidance, the proportion of councils that would be expected to continue with no specific contaminated rules (scenario 1 above) is around 10–20 per cent. The proportion of councils that would be expected to continue to use existing guidelines (scenario 2) is around 20–40 per cent, with the proportion of councils that would be expected to adopt the new guidelines (scenario 3) ranging from around 40 to 70 per cent.

Estimated remediation costs for 100 contaminated sites of different types are outlined in table 4 below. These are additional costs created by the NES.

Table 4: Estimated remediation costs

Site type (former use)	Typical cost	Assumed prevalence	Number (est)	Cost (est)*
Timber treatment	$200,000 per hectare	5%	5	$440,000
Horticulture	$170,000 per hectare	45%	43	$3,400,000
Sheep-dip	$15,000 per site**	50%	48	$170,000
Total				**$4,010,000**

Source: Covec, 2010, p 23 (includes corrected total).

* These estimates assume costs are spread evenly over 20 years. Future costs are discounted at 8 per cent.

** It is assumed that half of these sites require remediation. Risk is managed on the remaining half by altering dwelling location.

Although the remediation of sites may be necessary regardless of whether contamination is identified pre- or post-development, remediation costs may be considerably higher if contamination is not identified until after a site has been developed. The NES could reduce these 'excess' remediation costs and the costs of resolving disputes, of which there are one to two (over liability) per year, imposing costs of between $20,000 to $60,000 to resolve. Additional costs may also be incurred, such as:

- alternative accommodation for affected landowners
- health treatment expenses
- post-development remediation costs.

The total costs to society of such a dispute could exceed $100,000 (Covec, 2010, p 38).

5.3.4 Property values

As outlined above, implementing the NES could lead to an increase in compliance costs for those seeking to develop land in some areas. While this cost increase may not always prevent the development of contaminated land, there will be instances where increased assessment, application and remediation costs could eliminate the commercial viability of developing a site. The undeveloped contaminated sites would be expected to lose value because of reduced profitability. This could constitute a cost to the wider society because overall wealth has declined, unless this decline is offset by gains to other, non-contaminated sites.

5.3.5 Public health

It is likely the NES would lead to some affected land being subjected to more effective remediation, or it may prevent some affected land from being inappropriately developed for residential use. Such outcomes could lead to fewer people being exposed to harmful contamination.

Toxic impacts can lead to adverse health impacts as soon as individuals are exposed to contaminants. In extreme but rare cases, the effects of exposure to toxic contaminants can be fatal. The individuals most at risk in residential areas are likely to be children, who may come into close contact with contaminated soil through outdoor activity.

Where an increase in costs for remediation does not alter landowners' decisions to develop, contaminated sites in these areas would be remediated and developed to the standards contained in the NES. This would reduce the public health risk associated with these sites (Covec, 2010, table 11, pp 7 & 8).

The Covec report estimates that with the NES around 1685 individuals would be prevented from being exposed to excessive levels of harmful contamination. This figure is based on the report's assumptions about the number of sites converted to sensitive uses (eg, conversion of productive land to residential use).

Table 5: Estimated reduction in exposure to contamination

Site type	Number of sites	Exposure reduction
Timber treatment	5	155
Horticulture	43	1,400
Sheep-dips	48	130
Total	**96**	**1,685**

Preventing harmful exposure for 1685 individuals could result in one or two individuals avoiding illness. The public health benefits arising from this may be relatively insignificant (eg, if these illnesses are non-fatal cancers), or they may be substantial if two individuals would otherwise contract fatal illnesses (such as cancer) in the near future. The avoidance of two fatalities would generate public health benefits in the order of $270,000 to $1.3 million depending on when these incidents occurred within the next 20 to 40 years (Covec, 2010, p 35).

In addition to avoiding illnesses, there is a small but positive probability that the NES could also avoid one or more major contamination incidents involving highly toxic sites that could result in a number of additional fatalities. To the extent that the NES reduced the likelihood of such incidents, which could otherwise result in a number of fatalities, the public health benefits would be substantially greater. For instance, if the exposure to dangerous contamination led to an additional five fatalities, the estimated total benefit of the NES could increase by up to $4 million.

Negative public health impacts could potentially arise because of the NES for two reasons: if the NES was less conservative than the local standards imposed in a particular area, or if the NES resulted in some sites not being remediated because the costs of doing so were increased. In the latter case, those who inhabit or work on such sites may continue to be exposed to potentially harmful contamination. In practice, any such negative impacts are likely to be insignificant.

5.3.6 Environmental benefits

The focus of the NES is on achieving positive human-health impacts rather than improved environmental impacts. Thus any improvement in environmental impacts would be an unintended by-product of the NES. Potential environmental effects of contaminated land include adverse effects on aquatic flora and fauna due to the migration of contamination from the site. The magnitude of such effects is related to the toxicity of the compound, whether the exposure pathway is complete, the physical characteristics of the transporting medium and receiving environment, and the sensitivity of the organisms affected.

The principal modes of contaminant transport from contaminated land to off-site sensitive receiving environments include:

- contaminants adsorbed to particulate matter transported from the site (eg, in air or stormwater)
- dissolved contaminants leaching through the soil profile to groundwater, and subsequently being transported in groundwater to a receiving surface water body (eg, a watercourse or estuary)
- phytotoxic effects (effects on plant growth) within and adjacent to the contaminated site.

The introduction of the NES may result in improved environmental outcomes to the extent that developed sites are remediated to a higher level. There may, however, be some negative impacts. Specifically, if the NES results in some contaminated sites not being developed because increased remediation costs make this prohibitively expensive, these sites may continue being put to their existing use. This may result in the current contamination continuing to have a negative impact on the environment. This negative impact may be minor, however, due to the existing controls for avoiding or mitigating these effects, because the NES will not affect the ability of regional councils to enforce their own discharge controls in accordance with section 15 of the RMA (Covec, 2010, pp 39 & 40).

5.4 Implementation and support

The NES will affect existing regulation to the extent that it replaces territorial authority plan rules related to assessing and managing contaminants in soil. Specifically, the NES will replace around 18 district planning controls and insert new controls into all remaining district plans. Territorial authorities will be responsible for giving effect to, and enforcing the requirements of, the NES. Prior to and following the NES coming into force it is crucial that territorial authorities, as the key implementing agencies, are brought up to speed with the new requirements and adjust their council processes to manage their contaminated land information adequately.

To help councils implement the NES, the Ministry is planning a series of workshops and the release of implementation guidance contained within a national compliance strategy. This strategy is likely to specify the following monitoring, evaluation and review functions (Ministry for the Environment, 2010b).

- Regular reviews of the soil contaminant values within the NES by the Ministry and the Toxicology Advisory Group, usually every five years: alternatively, reviews may be undertaken in response to any important changes to the underlying science. The list of soil contaminant values is intended to be incorporated by reference, so that any revision does not trigger an amendment to the NES each time.
- Regular reviews by the Ministry or the Environmental Protection Authority of the NES (usually every five years): these reviews will evaluate how effective the NES has been at meeting its policy objective and will determine if any revisions are necessary or if additional support is required. The reviews are likely to include:
  - an audit of randomly selected councils against specific criteria, including how they identify sites (ie, the presence and adequacy of their administration systems) and how they implement the NES planning controls
  - monitoring the frequency of post-development disputes concerning contaminants.

Supporting and monitoring the implementation of the NES will be an ongoing (but minor) cost for central government (Minister for the Environment, 2011).

5.5 Overall impact of the NES

5.5.1 Comparison of status quo with changes under the proposed NES

Taking into account the evaluation of all costs and benefits, the Covec report provides the following summary of the costs and benefits of the NES compared with the status quo.

Table 6: Estimated costs and benefits of the NES compared with the status quo

Certainty	Estimated Benefits	Estimated Costs
High	Avoided Plan change costs for councils • $1 million	Information systems upgrade • $0.5–1 million
	Avoided Plan change submission costs • $1.5 million	
	Reduced consent application costs (eg, disputes regarding SGVs) • $0.5 million	
	Avoided consent costs for tank pulls • $1–2 million	
Low	Avoided contamination response costs for councils, Govt • $0–2 million	Increased remediation costs • $4.5 million
	Avoided public health costs • $0–1.5 million	Increased consent application and investigation costs • $1 million
	Avoided post-development remediation costs • $0–0.5 million	Reduced property values • $0–0.5 million
	Avoided post-development dispute costs • $0.5–1 million	
	Potential environmental benefits • Unquantified	
Totals	**Benefits**	**Costs**
	$4.5–10 million	**$6–7 million**

Notes:

1. Based on around 50 councils implementing their own rules over the next five to 10 years, with three councils implementing their own contaminant standards; also five councils have their proposed changes appealed to the Environment Court.
2. Based on average costs of around $10,000 to $20,000 per council for around 40 to 50 smaller councils with two or three larger councils incurring $100,000 in costs; costs are spread over the next two years. Although an information systems upgrade per se is not a mandatory requirement of the NES, councils will need to assess how best to support NES implementation.
3. Assumptions that, without the NES, around 50 councils would amend the contaminated land provisions within their district plans at their regular 10-year review; each proposed change would attract an average of 10 small (local) submitters and four large (national) submitters, with five proposed changes appealed to the Environment Court.
4. Assuming that the NES reduces minor disagreements regarding one or two consent applications per year this could avoid costs of around $20,000 to $40,000 per year (for both parties combined). Additionally, if over the next 20 years, three application disputes that would otherwise be resolved in the Environment Court are also avoided, the total benefit could be in the order of $400,000.

5. According to industry sources, there are around 200 fuel tank pulls per year, with around 10 per cent currently requiring resource consent. The additional cost to applicants of obtaining resource consent is typically in the order of $5,000 to $10,000.
6. See full cost benefit for detail for assumptions with low certainty.

Source: Covec, 2010, table 1, p iv.

5.5.2 Risk of acting or not acting if uncertain or insufficient information

The Covec report notes (p iii) there is a degree of uncertainty regarding:

- the total area of land developed for residential use in the future that may potentially be contaminated because of previous use and where this land is located
- the area of this potentially contaminated land that would be identified as such by councils and investigated for actual contamination in the absence of the NES
- the proportion of land area with levels of contaminants that exceed the soil guideline values specified in the NES, as well as the specific contaminants and the actual levels at which they are present
- whether any contamination would be addressed by remediation or some other, potentially less costly, approach (eg, altering the location of buildings)
- the approach or method the landowner would choose to manage the risk on his land (clean up often more costly than containing the contaminants on site)
- the level of risk that residents would face if they were exposed to the contamination currently present on this land
- the number of individuals that would subsequently develop illnesses because of exposure to this contamination, what these illnesses would be, when they would occur, and whether these illnesses would be fatal.

Despite the uncertainty regarding the level and type of contamination, the high levels of contaminants present at some contaminated sites suggest it is possible the NES could reduce risks by significant amounts. Due to the degree of uncertainty, the Covec report was unable to make a strong conclusion regarding a net benefit to society. The report did note that "based on what is considered by stakeholders to be the most likely scenario, the magnitude of costs and benefits arising from the NES are expected to be broadly similar" (p vi).

Development of contaminated land, especially earthworks and land-use change, can increase the risk of exposing people and the environment to contaminants. Planning controls are important, particularly at the time of development. A Ministry review of contaminated land provisions in district and city plans showed the plans had widely variable controls and that most district plans do not yet reflect the amendments relating to land functions made to the RMA in 2005. This review of district plans found that only 14 had rules which addressed their contaminated land function under the RMA. Without specific rules, decisions on resource consent applications are more likely to be ad hoc and to result in the inappropriate development of land that may:

- put people's health at risk
- provoke community concern
- initiate expensive post-development disputes and require remediation or containment to correct.

5.6 Cost–benefit conclusions

An assessment of the costs and benefits of the NES shows that the nationwide impacts are expected to be positive. Although the site-specific impacts cannot be quantified, it is likely that they will be positive.

The introduction of the proposed NES would generate several benefits to society (notably via improved administrative efficiency), including:

1. avoided plan changes
2. avoided submission costs
3. reduced resource consent costs
4. improved controls – the NES would eliminate the risk of allowing inappropriate development of contaminated land, which would lead to:
   - improved public health
   - avoidance of post-development disputes and/or remediation
   - avoided contamination response measures
   - potential improved environmental outcomes.

The introduction of the proposed NES would also generate costs, including:

1. additional administrative costs to councils implementing the NES
2. compliance costs to landowners in higher investigation and remediation costs
3. reductions in the value of affected land.

The nationwide estimated costs of the NES could be in the order of $6 to $7 million over the next 20 years. The total estimated benefits could be in the vicinity of $4.5 to $10 million (see table 6, above).

5.7 Summary: efficiency and effectiveness

Having considered the available options, the NES is considered the most appropriate way of achieving the policy objective. The options were compared against the policy criteria given in section 3 above. That analysis found the NES to be the most effective option to achieve the policy objective.

Section 5 has assessed the NES option against the status quo and concluded that there will be both costs and benefits. The NES will deliver important benefits, including national consistency in human-health thresholds and improved administrative efficiency. Overall, it is considered the NES is the most appropriate, effective and efficient means of achieving the objective of ensuring land affected by contaminants in soil is appropriately identified and assessed at the time of being developed and, if necessary, remediated to make the land safe for human use.

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Appendix A: Post-consultation National Environmental Standard, as agreed by Cabinet

The text below is an extract from Cabinet Paper CAB (11) 68 – *A Proposed National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*.

	Control	Activity	Outcomes sought by terms and conditions (I = indicative limit)	Default
1.	Permitted	The removal of underground petroleum storage systems and associated subsurface soil sampling and impacted soil removal.	**Limits on the:** a) volume of soil disturbance (I: 30m3 of soil in aggregate per tank) b) duration of the disturbance (I: 1 month) **Requirements to:** c) notify the council prior to the commencement of the activity d) dispose of removed soil at facility authorised or consented to receive such waste e) prepare and report the findings of site investigations to the council within a specified timeframe f) undertake the tank removal, investigation, remediation, validation and management processes in accordance with the *environmental management plan for UPST removal / replacement* contained in substance or incorporated by reference.	Controlled (3) or Restricted Discretionary (4)
2.	Permitted	Small-scale and temporary soil disturbance and subsurface soil sampling	**Limits on the:** a) volume of soil to be disturbed (I: 25m³ per 500m² of land) – limit does not apply to subsurface sampling b) duration of the disturbance activity (I: 1 month) **Requirements to:** c) minimise the adverse effects of mobilised contaminants d) reinstate to an erosion resistant state within a specified time limit (I: 1 month) **Restrictions on the:** e) removal of soil off the site, except for samples taken for the purpose of laboratory analysis. f) compromising of the integrity of any structure designed to contain contaminated soils or other contaminated materials.	Controlled (3) or Restricted Discretionary (4)
3.	Controlled	Land-use change, subdivision, disturbance of land where the risk to human health from soil contamination **does not exceed the soil contaminant value (SCV) for the intended land use** as per below.	**Requirements for:** a) site investigation report confirming that the risk to human health from soil contamination does not exceed the SCV for the intended land use in accordance with SCV standards derived in substance (or incorporated by reference). **Standards relating to:** b) the undertaking of site investigation and person who undertakes it derived in substance (or incorporated by reference) from *Contaminated Land Management Guideline No.12* and *Contaminated Land Management Guideline No. 53.*	Restricted Discretionary (4)

	Control	Activity	Outcomes sought by terms and conditions (I = indicative limit)	Default
			The ability to control the following types of matters under the terms and conditions of any resource consent: 1. Where there is a risk of significant adverse effects on other receptors from contaminants present on the site (eg, built structures, ecological and amenity values, soil quality), the adequacy of reporting and nature and scope of monitoring and management requirements including any site management plan. 2. Where soil and other materials are to be removed from the land, the appropriate tracking, and safe transport to land that is authorised and/or consented for the disposal of any the soils and materials. 3. Duration of the consent. 4. Timing and nature of review of consent conditions. **Notification:** Applications for controlled activities under this rule to be considered without publically notifying them.	
4.	Restricted Discretionary	Land-use change, subdivision, disturbance of land where the risk to human health from soil contamination **exceeds the SCV** for the **intended land use** for the intended land use as per below.	**The ability to exercise discretion over the following matters in terms of whether a resource consent will be granted and the terms and conditions that should apply:** *Assessment of the land* 1. The extent to which the level, nature and extent of soil contamination has been characterised and is suitable for the intended land use (as defined in Appendix B), including but not limited to: a. in circumstances where there is no SCV for a contaminant, the extent to which a soil contaminant value protective of human health has been selected and justified against standards derived in substance (or incorporated by reference) *from Contaminated Land Management Guideline no. 2*[4] b. in circumstances where a site-specific approach has been adopted in selecting an SCV, the extent to which a soil contaminant value protective of human health have been derived in substance (or incorporated by reference) from the *MfE site specific methodology*[5]. c. the effects of the contamination on built structures, ecological and amenity values, soil quality. *Remediation and management and monitoring plans* 2. The approach to the remediation and/or ongoing management of the land and the mitigation measures (including the frequency and location of monitoring of specified contaminants monitoring). 3. The methods to address the risk posed by the contaminants to human health. 4. The extent to which the detailed site investigation, site investigation report, and monitoring and risk management plan were approved by an appropriately qualified and experienced practitioner in accordance with *Contaminated Land Management Guideline no. 1*[2]. 5. The extent site investigation and reporting was undertaken by in general accordance with *Contaminated Land Management Guideline No. 5*[3]. 6. The timing of the remediation.	Controlled (3) for a)

Control	Activity	Outcomes sought by terms and conditions (I = indicative limit)	Default
		Site validation 7. The standard of remediation on completion and the adequacy of the site validation report. *Soil removal, transport and disposal* 8. Where soil and other materials are to be removed from the land, the appropriate tracking, and safe transport to land that is authorised and/or consented for the disposal of any contaminated soils. *Duration, review and financial bonds* 9. Duration of the consent. 10. The timing and nature of reviews of consent conditions. 11. The requirement for and conditions of a financial bond. *Cross-agency requirements* 12. The nature of any relevant regional council requirements or consent conditions. Note: to promote communication between councils and the considering of alignment with any regional consent requirements or existing consent conditions. Not intended for the territorial authority to determine the regional consent requirements.	

Documents referenced in table

1. Ministry for the Environment. Unpublished. *Environmental Management Plan for UPST removal / replacement*.
2. Ministry for the Environment. 2003. *Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand*. Ministry for the Environment: Wellington.
3. Ministry for the Environment. 2004. *Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils*. Ministry for the Environment: Wellington.
4. Ministry for the Environment. 2003. *Contaminated Land Management Guidelines No. 2: Hierarchy and Application in New Zealand of Environmental Guideline Values*. Ministry for the Environment: Wellington.
5. Appendix 2 of the discussion document *Proposed National Environmental Standard for Assessing and Managing Contaminants in Soil* as amended after considering submissions.

Note – Permitted Activity 2

- Limit a) does not apply to subsurface sampling – the intent is to exclude the obtaining of samples for the purpose of characterising the nature and extent of contamination.
- For clarity excludes disturbance associated with ongoing activities associated with an existing use (section 10 RMA).
- To apply limit a) and restriction e) site may require definition. The intent is to allow movement of soil across legal property boundaries where these boundaries are part of a collective site (ie, multiple adjoined lots owned by the same person).

Soil contaminant values and land-use scenarios

How is acceptable and unacceptable for use determined?

Soil contaminant values ($SCVs_{(health)}$) have been developed for 12 priority contaminants to determine the acceptability of contamination, and therefore whether or not resource consent is required.

$SCVs_{(health)}$ are soil contaminant concentration levels at or below which the exposure is judged to be acceptable because any adverse effects on human health for most people are likely to be acceptable for the intended land use. The $SCVs_{(health)}$ for selected contaminants and generic land-use scenarios are provided in Table A2, A3 & A4.

To determine whether land is acceptable for use, measured concentrations of contaminants are required to be compared against $SCVs_{(health)}$ applicable to the categories described in Table A1.

Table A1: How to determine which SCVs (health) are applicable

Category	Applicable $SCVs_{(health)}$
Land use or intended land use **fits within** the generic land-use scenarios described in Table 4	$SCVs_{(health)}$ contained in Tables 2 and 3
Land use or intended land use results in **greater human exposure** than for any of the generic land-use scenarios.	Site-specific $SCVs_{(health)}$ **must** be derived using the methodology described in the *Site-specific Assessment*,[16] **except** for land-use scenarios where produce consumption is greater than for the home-grown produce consumption exposure scenarios described in Table 4.
Land use or intended land use results in **lesser human exposure** than for any of the generic land-use scenarios.	Site-specific $SCVs_{(health)}$ **may** be derived using the methodology described in the *Site-specific Assessment*.
There is **no $SCVs_{(health)}$** for the contaminant of concern.	Soil contaminant values protective of human health and selected and justified in accordance with *Contaminated Land Management Guidelines No. 2 Hierarchy and Application in New Zealand of Environmental Guideline Values*.

If the soil contaminants exceed $SCVs_{(health)}$ (ie, is unacceptable for use), the activity is a restricted discretionary activity (resource consent is required). If the soil contaminants meet, or are under, $SCVs_{(health)}$ (ie, acceptable for use), the activity is permitted and no resource consent is required.

Table A2: Summary of soil contaminant values for inorganic substances (mg/kg)

	Arsenic	Boron[1]	Cadmium (pH 5)[2]	Chromium[1]		Copper[1]	Inorganic lead	Inorganic mercury compounds[3]
				III	VI			
Rural residential / lifestyle block 25% produce	17[4]	NL	0.8	NL	290	NL	160	200
Residential 10% produce	20	NL	3	NL	460	NL	210	310
High-density residential	45	NL	230	NL	1500	NL	500	1000
Recreational	80	NL	400	NL	2700	NL	880	1800
Commercial / industrial outdoor worker / maintenance	70	NL	1300	NL	6300	NL	3300	4200

1 SCVs for boron, chromium III and copper are much greater than the soil concentration at which plant health will be affected. Plant and other environmental effects may need to be considered separately.

2 Default value is for pH 5. See Appendix 1 of the *Methodology Report*[17] for SCVs at other soil pH values.

3 The inorganic mercury SCV does not apply to elemental (pure) mercury.

4 Derived value replaced with 99th percentile of national dataset of background concentrations as described in the *Methodology Report*.

Note: NL = No Limit. Derived value exceeds 10,000 mg/kg.

[16] Appendix 2 of the discussion document *Proposed National Environmental Standard for Assessing and Managing Contaminants in Soil* as amended after considering submissions.

[17] Ministry for the Environment, Unpublished, *Methodology for Deriving Soil Contaminant Values Protective of Human Health*, as amended after submissions.

Table A3: Summary of soil contaminant values for organic compounds (mg/kg unless shown otherwise)

Scenario	BaP [1] (mg/kg)	DDT (mg/kg)	Dieldrin[2] (mg/kg)	PCP[3] (mg/kg)	Dioxin (µg/kg TEQ)[4]	
					TCDD	Dioxin-like PCBs[5]
Rural residential / lifestyle block 25% produce	6	45	1.1	55	0.12	0.09
Residential 10% produce	10	70	2.6	55	0.15	0.12
High-density residential	24	240	45	110	0.35	0.33
Recreational	40	400	70	150	0.60	0.52
Commercial / industrial outdoor worker / maintenance	35	1000	160	360	1.4	1.2

1 SCV to be compared with the equivalent BaP concentration calculated as the sum of each of the detected concentrations of the nine PAHs listed in table 40 of the Methodology Report multiplied by the respective PEF.

2 SCV for dieldrin also applies to aldrin separately, or to the sum of aldrin and dieldrin where both are present.

3 Consideration should be given to investigating dioxins for PCP concentrations in excess of 0.3 mg/kg, see last paragraph of section 6.

4 TCDD TEQ calculated as the sum of each of the 17 PCDDs and PDDFs, or 12 PCBs listed in table 46 of the Methodology Report, multiplied by the respective 2005 WHO TEF (table 46).

5 The SCV applies to only the 12 dioxin-like PCBs. The 'ordinary' toxicity of the simple sum of the concentrations of these and all other detected PCBs must be considered separately.

Table A4: Land-use scenarios

Scenario	Description
Rural / lifestyle block	Rural residential land use, including home-grown produce consumption (25 per cent). Applicable to the residential vicinity of farm houses for protection of farming families, but not the productive parts of agricultural land. (Not for regulatory use.)
Residential	Standard residential lot, for single dwelling sites with gardens, including home-grown produce consumption (10 per cent).
High-density residential	Urban residential with limited soil contact, including small ornamental gardens but no vegetable garden (no home-grown produce consumption); applicable to urban townhouses, flats and ground-floor apartments with small ornamental gardens, but not high-rise apartments.
Parks / recreational	Public and private green areas and reserves that are used for active sports and recreation. This scenario is intended to cover playing fields and suburban reserves where children play frequently. It can also reasonably cover secondary school playing fields but not primary school playing fields. Check exposure for park maintenance staff using commercial / industrial unpaved.
Commercial / industrial outdoor worker (unpaved)	Commercial / industrial site with varying degrees of exposed soil. Exposure of outdoor workers to near-surface soil during routine maintenance and gardening activities with occasional excavation as part of maintaining sub-surface utilities (ie, a caretaker or site maintenance personnel). Also conservatively applicable to outdoor workers on a largely unpaved site.

Appendix B: Section 32 of the RMA

32 Consideration of alternatives, benefits, and costs

(1) In achieving the purpose of this Act, before a proposed plan, proposed policy statement, change, or variation is publicly notified, a national policy statement or New Zealand coastal policy statement is notified under section 48, or a regulation is made, an evaluation must be carried out by—

(a) the Minister, for a national environmental standard or a national policy statement; or

(b) the Minister of Conservation, for the New Zealand coastal policy statement; or

(c) the local authority, for a policy statement or a plan (except for plan changes that have been requested and the request accepted under clause 25(2) (b) of Schedule 1); or

(d) the person who made the request, for plan changes that have been requested and the request accepted under clause 25(2)(b) of Schedule 1.

(2) A further evaluation must also be made by—

(a) a local authority before making a decision under clause 10 or clause 29(4) of Schedule 1; and

(b) the relevant Minister before issuing a national policy statement or New Zealand coastal policy statement.

(3) An evaluation must examine—

(a) the extent to which each objective is the most appropriate way to achieve the purpose of this Act; and

(b) whether, having regard to their efficiency and effectiveness, the policies, rules, or other methods are the most appropriate for achieving the objectives.

(3A) This subsection applies to a rule that imposes a greater prohibition or restriction on an activity to which a national environmental standard applies than any prohibition or restriction in the standard. The evaluation of such a rule must examine whether the prohibition or restriction it imposes is justified in the circumstances of the region or district.

(4) For the purposes of the examinations referred to in subsections (3) and (3A), an evaluation must take into account—

(a) the benefits and costs of policies, rules, or other methods; and

(b) the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the policies, rules, or other methods.

(5) The person required to carry out an evaluation under subsection (1) must prepare a report summarising the evaluation and giving reasons for that evaluation.

(6) The report must be available for public inspection at the same time as the document to which the report relates is publicly notified or the regulation is made.

Appendix C: Overview of Public Submissions

Public notification

The proposed NES was publicly notified on 6 February 2010 in the main national and regional newspapers. The discussion document *Proposed National Environmental Standard for Assessing and Managing Contaminants in Soil* was made available on the Ministry's website and in hard copy.

Copies of or links to the discussion document were sent to:

- chief executives and planning managers of every regional council and territorial authority
- chief executives of every iwi authority
- Local Government New Zealand
- public and community interest groups
- professional organisations and industry groups including the Waste Minimisation Institute of New Zealand, Institute of Professional Engineers NZ and Resource Management Law Association.

Opportunity for the public and iwi authorities to comment

Consultation ran for 10 weeks until 19 April 2010. In March 2010, the Ministry held 14 workshops throughout the country. The workshops were held to inform people about the proposal and to help them make a submission. The workshops were well attended and attracted over 450 people from local government, health agencies, industry and the community.

Overview of submissions

One hundred and six submissions were received on the proposal from local government (42), industry (33), central government, community groups and individuals.

The majority of submitters either supported (13 per cent) or conditionally supported (55 per cent) the proposal. Eleven per cent of submitters opposed the proposal with the remainder either having a mixed (16 per cent) or not stated position (5 per cent). Regardless of their position, over other details of the proposal most submitters agreed or conditionally agreed (77 per cent) that a NES was the most appropriate instrument to achieve the objective.

An overview of the sectors represented and the position of submitters is shown in Figures C1 and C2.

Figure C1: Proportions of submissions, by sector

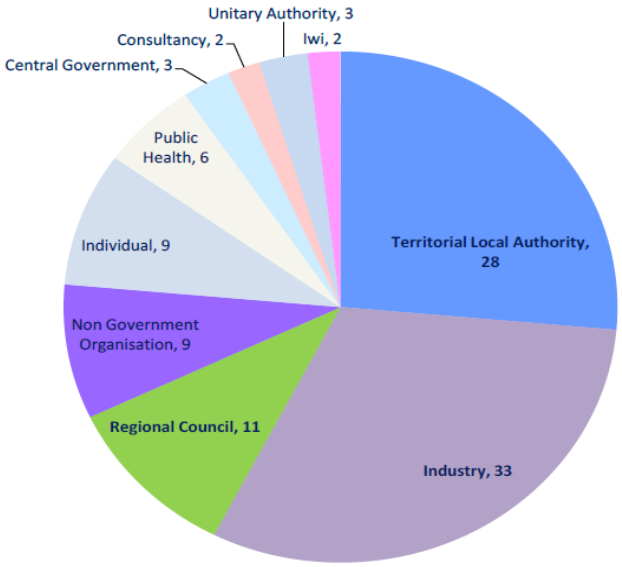

Figure C2: Breakdown of submitters' positions