

Environmental Risk Management Authority

MONITORING REPORT

May 2010

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Report to the Minister for the Environment:
Monitoring the effectiveness of the Hazardous Substances and New Organisms Act
1996

ERMA New Zealand

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Executive summary

This report consists of three parts: an overview of the Hazardous Substances and New Organisms Act (HSNO Act) regime; an investigation of biological control under the HSNO Act; and indicator data. The report is based on data and information from the 2008/09 financial year. Data and information from outside this period is also used to provide a more complete analysis.

Part 1 from the report highlights the following messages:

- There were 189 incidents involving hazardous substances in 2008/09. Sixty of those incidents impacted on the environment and 58 impacted on human health.
- Data suggests the HSNO Act continues to prevent harm to the environment from new organisms. As in the previous six years, there have been no incidents causing significant adverse effects on the environment.
- Monitoring shows that since the reassessments of endosulfan, hydrogen cyanamide and methylated spirits, adverse effects of these chemicals on human health and the environment have reduced.
- The first approval to release a genetically modified organism with controls was approved under the HSNO Act in November 2008. This animal vaccine is yet to be used.
- Some territorial authorities are increasingly engaging with the HSNO Act. In 2008/09 a City Council successfully prosecuted a business for breach of hazardous substance controls under the HSNO Act.
- Two significant prosecutions taken under the Health and Safety in Employment Act related to incidents involving a hazardous substance and a new organism. No prosecutions were taken under the HSNO Act in relation to these incidents.

Part 2 of the report summarises ERMA New Zealand's investigation into the regulation of biological control under the HSNO Act. The investigation found that while the HSNO Act is effectively protecting the environment, there are challenges associated with introducing biological control agents to New Zealand under the current regime.

Part 3 of the report consists of data that has been collected for a set of key indicators since 2001. These provide a general indication on the effectiveness of different aspects of the HSNO Act regime. While these indicators are useful for identifying general trends, they must be treated with caution as reliability of data cannot be ensured.

Introduction

This report meets the requirement under Output 5.3 of the Environmental Risk Management Authority's (ERMA New Zealand) Statement of Intent for the three years from 2009/10. This Output signals ERMA New Zealand's intention to monitor and report on the extent to which the Hazardous Substances and New Organisms Act 1996 (HSNO Act) reduces adverse effects on the environment or people from hazardous substances or new organisms. This Output comes from sections 4 and 11(1)(b)(i) of the HSNO Act which state:

Section 4 "The purpose of this Act is to protect the environment, and the health and safety of people and communities, by preventing or managing the adverse effects of hazardous substances and new organisms."

Section 11(1)(b)(i) "The Authority may ... monitor and review ... the extent to which the Act reduces adverse effects on the environment or people from hazardous substances or new organisms."

"Environment" is defined in section 2(1) of the Act as:

"Environment includes –

- a) Ecosystems and their constituent parts, including people and communities; and*
- b) All natural and physical resources; and*
- c) Amenity values; and*
- d) The social, economic, aesthetic, and cultural conditions which affect the matters stated in paragraphs (a) to (c) of this definition or which are affected by those matters."*

"People" in section 11(1)(b)(i) has been taken to mean "the health and safety of people and communities", in line with the purpose of the Act as stated in section 4 (above).

ERMA New Zealand has prepared a monitoring report annually since 2001. These reports have been entitled "Monitoring the Effectiveness of the Hazardous Substances and New Organisms Act 1996", where the word "effectiveness" has been used to incorporate concepts of "efficiency" as well as "impact". The earlier reports consisted of commentary and analysis of up to 41 numerical indicators, based on data from the preceding financial year. Since the 2006/07 report, published April 2008, the annual Monitoring Report has consisted of commentary on the overall performance of the HSNO Act regime in the preceding financial year, alongside a deeper analysis of the performance of the HSNO Act in a particular sector. The numerical indicators are also reported.

This Monitoring Report follows an equivalent format to recent years. Part 1 consists of commentary of the overall performance of the HSNO Act in the 2008/09 financial year. Part 2 summarises the major conclusions of an investigation on the impact of the HSNO Act on the investigation and release of biological control agents in New Zealand. Part 3 summarises the numerical indicators, drawn from data from the financial years 2001/02 to 2008/09.

Part 1

Overview of the HSNO Act 2008/09

This section reviews the extent to which the HSNO Act reduced adverse effects on the environment or people from hazardous substances or new organisms as required by section 11(1)(b)(i) of the HSNO Act.

HSNO Act incidents 2008/09

The number, magnitude and distribution of incidents are key measures of the extent to which the HSNO Act reduces adverse effects on the environment and people.

An incident is defined as an event involving a hazardous substance or new organism that may involve non-compliance with regulatory requirements and/or cause adverse effects to human health and safety or to the environment. A summary of incidents is published in ERMA New Zealand's Annual Report (ERMA New Zealand, 2009a) and is re-summarised here, along with commentary on some of the stand-out incidents in the 2008/09 year:

Hazardous substance incidents classification and analysis

There were 189 incidents involving hazardous substances reported to ERMA New Zealand during the year July 2008 to June 2009. These can be analysed in different ways:

Location

An analysis of those 189 incidents by location shows that 92 occurred in public places, 79 in workplaces, 44 in private dwellings, 22 involved motor vehicles and 8 involved aircraft, ships or trains. Fifty three of the 189 incidents occurred in locations that are defined in two or more ways; for example several incidents occurred at private dwellings that are also workplaces.

Severity

ERMA New Zealand classifies hazardous substance incidents according to the level of severity, from Level 1 (minor – no long-term effect) to Level 4 (extreme – permanent damage). In 2008/09 there were no incidents classified Level 3 or Level 4. Twenty six incidents were classified Level 2, defined as localised damage to property or environment, affecting up to 10 people for more than 24 hours and up to two deaths. These 26 incidents were as follows:

- seven incidents were the result of misadventure including three incidents related to illegal drug use or manufacture (fires and explosions), two incidents from pranks (fireworks and lit LPG cylinder) and two incidents from drinking hazardous substances (methanol and sodium hydroxide cleaning product). There were two deaths from these incidents, one from an explosion related to illegal drug manufacture, and one from drinking methanol;
- nine incidents occurred at workplaces resulting in serious injuries to workers, including three LPG explosions, three involving serious burns, two involving serious chemical burns (from dye and cleaning chemicals), and one spill resulting in serious harm;
- four incidents occurred at workplaces resulting in environmental damage, including two spills resulting in soil contamination (copper chrome arsenate and caustic soda), and two instances of spray-drift resulting in damage to plants in neighbouring properties;
- four incidents occurred at home or in public places, including two chemical burns from cosmetic products (bath foam and hair dye), one explosion while filling an LPG bottle, and one death from clothing catching fire from an LPG heater; and
- two incidents involved death of domestic animals.

Impact on environment

Sixty incidents in 2008/09 were recorded as having an adverse effect on the environment, and six of these were classified Level 2 (see above), where the incidents involving death of domestic animals are included in the definition of environment.

The impact of hazardous substances on the environment is also assessed by the Ministry for the Environment (MfE) in its fresh water quality and soil health monitoring programme. The most recent 'State of the Environment' report (MfE, 2007) shows that pesticide concentrations in all monitored groundwater in the 2006 survey, except one, complied with New Zealand drinking water standards. To better manage and prevent adverse effects on the environment due to hazardous substances used within an agricultural setting, a data collection project is being undertaken by ERMA New Zealand. This seeks to work with industry to gain better agrichemical data, so that hazardous substance use and the potential adverse effects can be better understood.

Impact on people

Fifty-eight of the 189 incidents were recorded as having an adverse effect on human health and include three deaths (see above).

Reports of adverse effects on human health caused by hazardous substances most commonly relate to acute effects which can often be linked to specific substances and exposures. Conversely, chronic effects are acknowledged as being particularly hard to identify. While it is understood that chronic effects make up a large proportion of the burden of occupational mortality and morbidity, it remains difficult to attribute chronic harms to specific substances and exposures.

In the year July 2008 to June 2009 there were eight notifications of injury caused by hazardous substances made under section 143 of the HSNO Act. This section of the Act requires all diagnosing medical practitioners to report injuries caused by hazardous substances to the Medical Officer of Health (Ministry of Health, 2009). The requirement to notify was introduced as a means of improving the evidence of acute and chronic health effects from exposure to hazardous substances. However, this requirement is not yet fully implemented therefore the data does not reflect injuries related to hazardous substances.

Hazardous substance incidents updates

Incidents involving ammonia

There were 40 incidents involving ammonia between July 2005 and June 2009. Twenty-six of these were anhydrous ammonia leaks from industrial refrigeration systems. These incidents appear to be attributable to operation and maintenance issues. In response to these incidents the Institution of Professional Engineers New Zealand (IPENZ), and the Institute of Refrigeration, Heating and Air Conditioning Engineers of New Zealand have produced a Practice Note. The Practice Note highlights where particular care is needed, and provides technical guidance on design, installation and maintenance of coolstores (IPENZ, 2009). Additionally, the Department of Labour (DoL) has included coolstores as a focus area for its 2009/2010 workplace assessments.

Other incidents involving ammonia between July 2005 and June 2009 were attributed to a range of causes including transport accidents, spills and puncturing of containers. Records show the main adverse effects of all the incidents involving ammonia were social disruption and the need for emergency services. Records also show that 16 persons required hospitalisation for precautionary measures or treatment of burns. Along with the work being undertaken by industry and other government agencies, ERMA New Zealand will continue to monitor adverse effects due to the use of ammonia.

Incidents involving chlorine

There were 46 incidents involving chlorine and chlorine producing substances between July 2005 and June 2009. Nine of those incidents were in public swimming pools, and resulted in 53 people requiring medical attention, ranging from a medical check to overnight hospitalisation. The swimming pool incidents affected groups of people, and often children. These incidents were the result of human error while dosing the pool water. Standards New Zealand has recently released a draft revised standard, NZS 5826, on pool water quality. The revised standard will include information on chlorine dosing and the safe handling and storage of chemicals.

The rest of the incidents were from a range of causes and situations, including cleaning products in food processing and domestic environments. These were also primarily caused by human error such as inappropriate mixing of chemicals. There were adverse effects on human health due to these incidents, but they were generally less severe than those associated with public swimming pools. ERMA New Zealand will continue to monitor incidents involving chlorine and chlorine producing substances to determine if further action is needed.

Response to Tamahere coolstore fire

In response to the fire at the Icepack Coolstore, Tamahere, in April 2008, actions have been taken to ensure the controls for the safe use of flammable gases are comprehensive and clear. The fire, in which one fire-fighter was killed and seven were seriously injured, was caused by a leak of a flammable refrigerant (LPG) ignited by an electrical event.

In December 2008, the Authority determined that there was significant new information to indicate that there were grounds for the modified reassessment of the approvals for LPG, propane and butane. A number of the proposed modifications – the use of an odorant for gas detection, and signage, quantity and containment controls – are in response to the Fire Service Report into the fire at the Icepack Coolstore.

In addition, a prosecution carried out under the Health and Safety in Employment Act 1992 (HSE Act) has since imposed fines and reparations totalling approximately \$390,000 on parties convicted following the incident. It was found that those responsible for the site had failed to

ensure the safety of the site, workers and others by having a refrigeration system that did not comply with current health and safety requirements, and through failing to take all practicable steps to warn of the hazardous refrigerants on site.

New organism incidents 2008/09

There were 28 new organism incidents reported for 2008/09, an increase from 11 in 2007/08. This rise was largely attributable to an increase in incidents at zoo containment facilities. There were a total of 19 reported incidents at these facilities compared with four from the previous year. While most of these incidents were of a minor or technical nature, five resulted in minor adverse effects on human health, and one involved a fatality (see below). Two other incidents involved the unapproved importation of new organisms. As in the previous six years, there have been no incidents causing significant adverse effects on the environment due to a new organism.

GM field test non-compliance

In December 2008, the New Zealand Institute for Plant and Food Research Limited, were found to be non-compliant with HSNO Act controls by allowing genetically modified brassicas to flower at a field test site in Lincoln. The Ministry of Agriculture and Forestry Biosecurity New Zealand undertook an incursion response at the field test site to assess the possibility of cross-pollination with surrounding crops. The investigation identified no significant risk to the environment. An inquiry was carried out by ERMA New Zealand which found that the controls would have been adequate to manage risk for the GM brassica and field test, if they had been complied with.

Zoo keeper fatality

In May 2009, a keeper at the Zion Wildlife Gardens was killed by a tiger. This is the first human fatality involving a new organism since the introduction of the HSNO Act. DoL alleges that Zion Wildlife Services Ltd failed to take all practicable steps to ensure the safety of employees while at work. DoL also alleges that Zion Wildlife Gardens Ltd failed to take all practicable steps to ensure that no hazard that is in the place of work harms people who are lawfully at work as employees of a contractor. Consequently, charges have been laid under the HSE Act. No charges have been laid under the HSNO Act, as the incident did not involve non-compliance with the keeper safety requirements in the zoo standard for containment facilities (MAF BNZ, 2007).

HSNO Act decisions and decision-making processes

The ability to decline or approve, with or without controls, a hazardous substance or new organism is a key mechanism of the HSNO Act. Integral to those decisions is the decision-making process, which includes engaging with stakeholders. The decision-making process is intended to ensure that robust decisions are made, and appropriate controls are imposed where applicable. A summary of significant decisions and measures of efficiency in the decision-making process are published in ERMA New Zealand's Annual Reports. Commentary on some of the stand-out examples in the 2008/09 year follow:

Hazardous substances decisions and decision-making

Submissions on notified hazardous substance applications

Between January 2002 and May 2009, ERMA New Zealand notified 321 applications to import or manufacture hazardous substances. Submissions were received for only 19 percent of the 321 notified applications. Of those 61 applications that drew submissions, 40 drew only one submission. Submitters represented all sectors of the community, including iwi, research and non-government organisations, individuals and industry, as well as local and central government agencies. Fourteen applications received submissions from government submitters only, 36 applications received submissions from non-government submitters only. Only 11 applications received submissions from both government and non-government submitters.

The recently enacted HSNO Amendment Act 2010 gives the Authority discretion to notify only those hazardous substance applications (under section 28 of the HSNO Act) which are considered to be of significant public interest. It is anticipated that this will enable more efficient and cost effective processing of applications under the HSNO Act.

Endosulfan reassessment

HSNO Act approval for the insecticide endosulfan was revoked in 2008, requiring all importation, manufacture and use of the substance to stop from 16 January 2009 (ERMA New Zealand, 2008). Endosulfan has been used on a variety of crops including vegetables, berry fruit and ornamentals in New Zealand. The reassessment found that endosulfan presents a high risk to aquatic species and significant risks to human health, Māori cultural wellbeing, society and the community. Since there are alternative products available for most uses, only minimal adverse effects upon the market economy are expected from this decision.

Following this ERMA New Zealand reassessment, endosulfan residues in food samples have decreased. Recent studies by the New Zealand Food Safety Authority of pesticide residues and contaminants in domestic food showed low levels of endosulfan residues in samples gathered in the first quarter of 2009. No samples in the second quarter of 2009 have been found to contain any endosulfan residues (New Zealand Food Safety Authority, 2009a, 2009b, 2009c). This indicates that the reassessment has been effective in reducing human exposure to this pesticide.

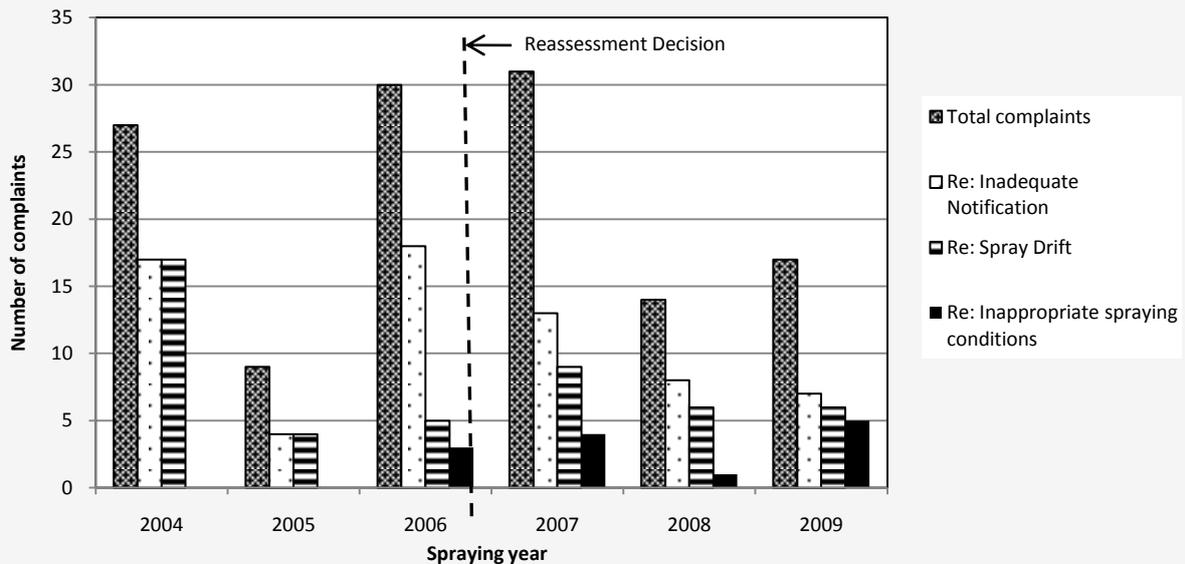
Hydrogen cyanamide incidents following reassessment

Reported complaints about spray drift of the pesticide hydrogen cyanamide have almost halved since the substance was reassessed in 2006 (see Figure 1). Hydrogen cyanamide is an agricultural chemical used by kiwifruit growers as a plant growth regulator, primarily used in the Bay of Plenty. The reassessment, in response to new information on changes in use and effects of hydrogen cyanamide, recommended that ERMA New Zealand monitor incidents

involving hydrogen cyanamide for five years. The reassessment decision noted that advances in technology have shown reductions in spray drift by as much as 85 percent.

An analysis of Environment Bay of Plenty data has shown that the total number of complaints reported has decreased from 31 to 17 in the three spraying seasons since the reassessment. There have also been no confirmed reports of adverse environmental effects due to hydrogen cyanamide spray drift since the reassessment.

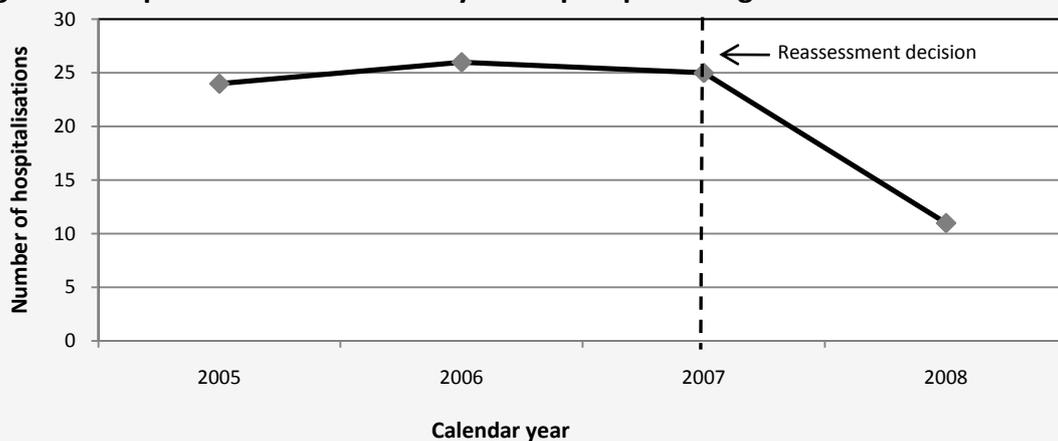
Figure 1: Environment Bay of Plenty hydrogen cyanamide spray drift complaints.



Methylated spirits incidents following reassessment

The HSNO Act approval for methylated spirits was reassessed in 2006. This was prompted by public health concern over the use of methylated spirits as an alcohol substitute. Methylated spirits contains ethanol, denatured with up to 2 percent methanol. Methanol causes severe injury, or death, when consumed. As a result of the reassessment, methylated spirits containing methanol is no longer available to the general public. Preliminary data shows that since this control came into force, on 21 June 2007, the number of hospitalisations due to methylated spirit poisoning has halved (Tisch & Slaney, 2009). This data is shown in Figure 2.

Figure 2: Hospitalisations from methylated spirit poisoning 2005-2008.



New organisms decisions and decision-making

First conditional release of a genetically modified organism

ERMA New Zealand approved, with controls, the first release of a genetically modified organism in 2008/09. Two genetically modified (GM) equine influenza vaccines (ProteqFlu and ProteqFlu Te) were approved for release with controls on 19 November 2008. The approval only allows the GM vaccines to be used in an Equine Influenza outbreak as defined by MAF BNZ; or in order to meet Overseas Market Access Requirements for export to a country that requires equine animals to be vaccinated using ProteqFlu or ProteqFlu Te. The vaccines have not been used in New Zealand to date.

No release applications received for non-GM microorganisms

To date ERMA New Zealand has not received an application to release a non-GM microorganism into the environment. However, there appears to be widespread interest in microbial products containing new organisms. A total of 223 enquiries relating to non-GM microorganisms were received between 2006 and 2009. Of those, 107 enquiries related to the potential importation of mixed microbial products for private or commercial use. Products ranged widely including: cleaning products, fertilizers, live microbial dietary supplements, sewage and compost treatments, and water purification products. The majority of the organisms contained within the products meet the definition of Risk Group One (AS/NZS, 2002), meaning that they are unlikely to cause human, plant or animal disease.

In order to import the mixed microbial products the importer needs to provide evidence that the bacteria are either not new organisms or obtain an approval to release the bacteria. Anecdotal evidence indicates that enquirers are deterred from making an application to release the organisms contained within their products by the application fee (previously \$33,750, now \$16,875 plus disbursements) and the accompanying information requirements. This may be an indication that the HSNO Act is restricting innovation in this area.

HSNO Act compliance activities 2008/09

Compliance with the HSNO Act is crucial to achieving the purpose of the Act. In addition to meeting legal requirements, compliance is also about taking the necessary steps to ensure the safety of people and the environment.

Hazardous substances compliance activities

Compliance is used as a proxy indication of reduced harm, where harm cannot be measured directly or in a timely manner. For example, a large proportion of harms occur where exposure has occurred over a long period of time (chronic exposure/chronic harm). This latency or delay in a harm manifesting itself makes it difficult to attribute the harm to a specific substance or exposure. The controls are designed to reduce exposure. Therefore, compliance with the controls means reduced exposure to hazardous substances and, *ipso facto*, reduced harm.

Reducing harm requires a range of actions, by both regulator and industry. ERMA New Zealand has focussed its attention on improving:

- industry awareness and understanding of the controls;
- our understanding of the levels of compliance with the controls; and
- our understanding of the barriers to compliance.

Overview of HSNO Act compliance

There are challenges in assessing the levels of compliance with the hazardous substance controls because of the scale of use of hazardous substances in New Zealand. It is estimated that there are more than 100,000 hazardous substances and more than 80 percent of these are used in workplaces. It is further estimated that 150,000 workplaces are using or storing hazardous substances in significant quantities.

Over the last few years, several reports have been published on the levels of hazardous substance compliance.

- The New Zealand Institute of Hazardous Substances Management estimated that compliance for location test certificates may be as low as ten percent.
- Auckland Fire Service found only 15 percent of Manukau workplaces inspected were fully compliant with HSNO controls for test certification, signage and emergency management plans.
- A Ministry for the Environment commissioned report found that 40 to 50 percent of small enterprises in specific industries were compliant with location test certificates, with some evidence of higher compliance linked to better awareness of the safety rules.
- A DoL survey in 2007/08 of more than 800 enterprises found compliance with hazardous substances controls to range from 30 to 60 percent.

The Department of Labour repeated their survey in 2008/09 on a much larger scale (over 2,000 sites), and reported that levels of non-compliance were notably lower. Whilst encouraging, ERMA New Zealand is cautious about the interpretation of these findings – the surveys are point in time estimates of specific industries and for specific HSNO requirements. How representative the findings are of compliance across all sectors and all areas is unknown.

Campaigns, publications and codes of practice

The HSNO Act regime places emphasis on all users of hazardous substances taking responsibility for their own actions. The HSNO Act agencies have supported this by providing information, education, and support for the development of codes of practice and best practice guidelines.

In 2008/09 DoL carried out 4,014 workplace assessments, 2,276 information visits and industry forums and conducted 325 site investigations under the HSNO Act. In addition, DoL carried out a further 5,690 workplace assessments, 5,541 information visits and industry forums, and 6,214 investigations, under its HSE Act enforcement obligations, many of which will have introduced better risk management practices to New Zealand workplaces.

ERMA New Zealand has continued to produce information tailored to specific industries and groups on how to achieve compliance with the HSNO Act controls. In 2008/09, this included:

- the publishing of guidance documents for the collision repair industry and for transit depots. These documents facilitate risk reduction by informing people how to safely manage the hazardous substances used within their specific industries;
- continued support for Test Certifiers and HSNO Act Enforcement Officers by offering a number of training courses, producing monthly publications and developing several new performance standards for the test certification process;
- development of an improved process for the renewal of Approved Handler Test Certification;
- maintenance of a toll-free hazardous substances compliance line, which drew over 6,000 enquiries in 2008/09; and
- seven new or revised Codes of Practice were approved in 2008/09, bringing the total number to 35. Approved Codes of Practice set out details on 'how to comply' in relation to a particular situation or practice.

The publishing of guidance documents represents an important mechanism to aid in increasing compliance, and therefore reducing harm. In the past three years, 11 major guides have been published with more than 25,000 being distributed to industry. These guides have been industry focused and include the:

- pest management/agricultural industry;
- transport industry and service stations;
- collision repair industry;
- retail hardware stores; and
- a number of aspects of the construction industry.

These industries represent just over half of the 150,000 workplaces using or storing significant quantities of hazardous substances. This indicates that ERMA New Zealand has produced guides for 30 percent of workplaces in the targeted industries.

Another 40,000 emergency guidance documents have been distributed, which are applicable across all industry groups, and aid workplaces in setting up emergency response plans. A survey in 2006 identified the absence of emergency plans as a common reason for non-compliance. Generally these productions have been a collaborative effort with industry groups and enforcement agencies.

Whilst ERMA New Zealand does not have definitive evidence as to the effectiveness of these publications, two pilot surveys on the publications prepared for the embalming industry and retail hardware stores have been completed. These found that at least 80 percent of respondents had received the guidance material, and of these 80 percent rated the quality of the information presented as either good or excellent.

Timber treatment industry's best practice guideline

ERMA New Zealand previously reported on the timber treatment industry's proposed review of their best practice guideline, to address concerns around the drying, or 'flash off', of timber treated with Light Organic Solvent Preservative (LOSP) (ERMA New Zealand, 2009b). A review of the guideline, and specifically of the requirements for flash off, was proposed in December 2007 following concerns that some builders and carpenters were becoming sick.

To address the issue, the timber treatment industry has undertaken research to establish new requirements for flash off. This involves setting a weight loss rate over a given time period, after which it can be deemed that sufficient flash off has been achieved and the timber is safe to handle. Initial results of research on flash off were expected to be reported by industry in April 2009. However, due to technical challenges the research is yet to be completed.

Voluntary product recall of cosmetics

In 2009 it was brought to ERMA New Zealand's attention that a number of cosmetic products containing iodopropynyl butylcarbamate (IPBC) were still available in New Zealand. The 2008 amendment to the Cosmetics Products Group Standard prohibited the use of IPBC in some types of cosmetics, allowing a one year phase out. This was based on new information on risks to human health from IPBC.

In response to the on-going sale of cosmetics containing IPBC, ERMA New Zealand issued a statement reminding suppliers and manufacturers that the standard had changed. Subsequently, a number of products were voluntarily recalled by manufacturers, and the industry supported the removal of all non-complying products from retail.

New organisms compliance activities

MAF BNZ Audits

The MAF BNZ core enforcement activity includes the inspection of containment facilities; border inspections; and incursion response and enforcement investigations for unapproved new organisms.

At the end of 2008/09 there were 170 containment facilities. The frequency of inspection is dependent on facility type and level of compliance. Microorganism, vertebrate, invertebrate, plant-house and zoo containment facilities are regularly inspected by MAF BNZ at either six monthly or yearly intervals. On average two in three facilities were fully compliant when inspected this year, and therefore deemed as providing minimal risk to facility employees and the outside environment. All those facilities issued with (usually minor) non-compliance reminders completed the required corrective actions to MAF BNZ's satisfaction.

HSNO Act enforcement action 2008/09

The formal enforcement tools currently available to HSNO Act enforcement agencies include compliance orders and prosecutions. Enforcement action is one of the means of achieving compliance with the HSNO Act. If the Act is complied with then the adverse effects on the environment and people are reduced. A summary of HSNO Act enforcement action taken in 2008/09 includes the following:

Hazardous substances enforcement action

From a survey of territorial authorities, there appears to have been an increase in the level to which some territorial authorities have engaged with the HSNO Act in 2008/09. Territorial authorities attended twice as many incidents during 2008/09 as the previous year, and there was a corresponding increase in the level of enforcement actions taken, including five compliance orders and one prosecution.

The prosecution, taken by Dunedin City Council (DCC), involved a number of breaches of HSNO Act controls relating to the storage of large quantities of flammable solvents at a domestic residence. The offender, the owner of a manicure business, was found guilty and fined \$25,000 plus expenses (Morris, 2009). This enforcement activity, led by the DCC, helped avoid a potentially serious hazardous substance incident.

The Department of Labour (DoL) reports that currently most prosecutions involving hazardous substances are taken under the HSE Act. During 2008/09 DoL took six prosecutions under the HSE Act for non-compliance involving asbestos, LPG and ammonia. No prosecutions were taken under the HSNO Act in 2008/09. DoL issued 89 HSNO Act compliance orders.

New organisms enforcement action

The compliance order provisions of the HSNO Act were used for the first time in 2008/09 relating to a new organism incident. MAF BNZ issued a compliance order to Plant and Food Research on 5 March 2009 following non-compliance with controls at the GM Brassica field test site. The compliance order requires a five-year programme of surveillance and soil management at the field test site to detect and remove volunteer plants which might contain genetically modified heritable material. MAF BNZ also issued a formal warning to the Trial Manager of Plant and Food Research, and indicated that any further incidents of this magnitude would result in prosecution. Plant and Food Research have discontinued the field test.

No charges were laid under the HSNO Act for a new organism incident in the 2008/09 year. One reason for this is that section 109(2) of the HSNO Act required that any information in respect of any offence must be laid within 120 working days. The HSNO Amendment Act 2010 extended this time limit to two years for offences relating to new organisms. This will make it more feasible for prosecutions to be taken under the HSNO Act, and will reconcile the time frame with the Biosecurity Act 1993.

HSNO Act regulatory changes 2008/09

Regulatory change has the potential of having a significant impact on the extent to which the HSNO Act can reduce adverse effects on the environment and people. For example, changes to the Act, the regulations or other regulatory tools can reduce or increase complexity, thereby affecting levels of compliance, costs to business and outcomes. Significant regulatory changes made in the HSNO Act regime in 2008/09 include the following:

Classifying self-introduced organisms as 'not new'

The Hazardous Substances and New Organisms (Organisms Prescribed as Not New Organisms) Regulations 2009 establish a process for prescribing self-introduced organisms as not new for the purposes of the HSNO Act. This regulation was developed following the establishment in New Zealand of a self-introduced strain of *Puccinia myrsiphylli* (bridal creeper rust). By prescribing this organism as not new the fungus is now legally able to be propagated and distributed as a biological control agent for bridal creeper. As bridal creeper is a serious plant pest in New Zealand, it is expected that the new regulation, and the 'not new' organism, will have beneficial effects on the New Zealand environment.

Segregation and tracing of genetically modified organisms

A new regulation was made in October 2008 to prescribe information that applicants must provide with any application for release with controls of a genetically modified organism under the HSNO Act. The regulations, Hazardous Substances and New Organisms (Genetically Modified Organisms - Information Requirements for Segregation and Tracing) Regulations 2008, mean that anyone applying to release with controls a genetically modified organism must provide ERMA New Zealand with information about specific measures the applicant intends to take to keep the genetically modified organism separate from other organisms and to trace the genetically modified organism. Although these regulations are yet to be used, they will provide benefits in potential scenarios where segregation between genetically modified crops and conventional and organic crops is desired.

HSNO Act engagement with iwi/Maori 2008/09

Sections 5(b), 6(d) and 8 of the HSNO Act require all people exercising functions, powers and duties under the Act to effectively engage with iwi/Maori. Effective engagement supports reducing adverse effects through both information sharing and involvement in HSNO Act decision-making processes. Significant engagement activities with iwi/Maori in 2008/09 include the following:

Wānanga-a-Tāne

A Wānanga-a-Tāne was held in March 2009 for members of ERMA New Zealand's Māori National Network. The aim of this forum was to share knowledge about valued flora and fauna, and in particular native flora and fauna that are used for medicinal purposes and are significant to iwi/Māori. The knowledge and information gathered will inform HSNO Act decision-making processes so that better effect can be given to sections 5(b), 6(d) and 8 of the HSNO Act. In particular the information is relevant to the assessment of applications that have potentially adverse effects on valued species and provides guidance to determine appropriate levels of consultation for specific application types.

A significant outcome of the Wānanga-a-Tāne was discussion on the challenges of assessing cultural intangibles within HSNO Act decision-making processes. Further discussion on cultural intangibles at the Māori National Network hui in September 2009 have led to a proposal for a wānanga in May 2010 to explore ways to improve the incorporation and assessment of cultural intangibles in HSNO Act decision-making.

Methyl bromide consultation

The fumigant Methyl bromide is currently being reassessed. Within the 2008/09 year, hui were held with iwi in Auckland, Tauranga, and Blenheim to identify local iwi views on the use of the fumigant in their region's ports. A range of views were voiced, including: concern about the health and well-being of workers and the local community; the fumigant's value as a tool in the ongoing protection of our native biodiversity; and its current importance in the fumigation of logs to ensure market access for log exports given the increasing interests iwi/Māori have in the forestry and timber sector in New Zealand. Acknowledging these wide-ranging views reinforces the importance of engagement with iwi/Māori if the requirements of sections 5(b), 6(d) and 8 of the HSNO Act are to be adequately met.

HSNO Act in the global environment 2008/09

New Zealand is party to several multilateral treaties and conventions that intersect with the HSNO Act regime. Our membership of these groups adds value to domestic efforts to protect the health of New Zealanders through access to the best international information and analysis regarding chemical risks and new organism management. Additionally, our membership contributes to reducing adverse effects on the environment and people in a global setting through a commitment to contribute to multilateral solutions. Significant HSNO Act activity in the global environment in 2008/09 that contributes to reducing adverse effects on the environment or people includes the following:

Notification of final regulatory action on endosulfan to the Rotterdam Convention

New Zealand is a party to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, more commonly known simply as the Rotterdam Convention. This Convention is a multilateral treaty to promote shared responsibilities in relation to international trade of certain hazardous chemicals. Parties are obliged to notify the Convention Secretariat of any final regulatory actions to ban or severely restrict a chemical for health or environmental reasons.

Following the decision to revoke the approvals for endosulfan, and, from 16 January 2009, prohibit the further importation and manufacture of endosulfan in New Zealand (ERMA New Zealand, 2008), the Ministry for the Environment notified the Rotterdam Convention of this final regulatory action within the mandatory 90 day period, thereby fulfilling New Zealand's obligations as a Party to the Convention.

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Part 2

Biological Control Agents and the HSNO Act

ERMA New Zealand has undertaken a study into the regulation of biological control under the HSNO Act, including how the regime has impacted on the introduction of new biocontrol agents. The findings of the study can be found in the ERMA New Zealand report: Investigating Biological Control and the HSNO Act, April 2010.

Biocontrol in New Zealand

Biocontrol is the use of one living organism to control another living organism (pest). Usually biocontrol does not eradicate the pest, but it can reduce the spread or vigour of the pest.

A number of plants and animals introduced to New Zealand — accidentally or deliberately — have become pests. Most of those pest species are not closely related to New Zealand's native plants and animals. As such, there is an opportunity to introduce biological control (biocontrol) agents to target pests without endangering native and valued species.

The HSNO Act regime

Prior to the HSNO Act the process for introducing a biocontrol agent was far less formal with only a simple risk assessment at best. The HSNO Act now provides a mechanism for independent decision-making, imposes a high level of transparency on the process, and allows for public participation. It specifies information that must be included in an application and things to take into account when making a decision. It places the responsibility of providing the information on the applicant.

The HSNO Act is inherently cautious. It requires an approval before the introduction of all new organisms on the premise that they will have adverse effects on the environment to some degree. It also directs the decision-makers to be cautious where there is scientific or technical uncertainty.

Effectiveness of the HSNO Act

A transparent process

A combination of statutory timeframes, specific decision-making criteria, an independent decision-making body and a capacity for public participation has produced a highly transparent process. Some researchers believe having a well regulated and independent decision-making process with specific timeframes and guidelines is the reason why New Zealand is one of the few countries in the world still releasing biocontrol agents. In other jurisdictions, where decision-making is entwined in government, it is thought that processes may be hampered by political considerations.

Applications approved and declined

Twelve applications covering 17 biocontrol agents have been approved for release. Nine applications were for the control of weeds, and three for the control of invertebrate pests. Two of the 12 applications were approved under the 'Release with Controls' provision of the HSNO Act.

Applicants are hesitant to make applications under this provision because they are concerned about the potential for ERMA New Zealand to apply controls that the scientists think are unnecessary, limit their ability to use biocontrol to its full benefit, or impose additional costs.

No applications for the release of biocontrol agents have been declined under the HSNO Act. This is the result of thorough pre-application discussions with applicants, a high level of information provided by the applicant, and researchers selecting agents that are most likely to meet the requirements of the HSNO Act.

Is it working?

To date, there is no evidence of any adverse effects on the environment or health and safety of people resulting from the release of a biocontrol agent under the HSNO Act. However, the establishment of a biocontrol agent can take many years and biocontrol agents released under the HSNO Act have only been in the New Zealand environment for a relatively short time. Therefore, it is too soon to make definite conclusions regarding their success as a biocontrol, or their adverse effects on the environment.

Decisions made prior to the HSNO Act were based on whether the biocontrol was likely to successfully control the pest. The HSNO Act is very specific about taking account of adverse effects on the environment. This is intended to ensure that decisions made under the HSNO Act regime result in safer outcomes for the New Zealand environment.

The amount and type of research around non-target effects was increasing in the years leading up to the introduction of the HSNO Act. It is likely the decisions made in the 1990s included similar considerations as those made under the HSNO Act regime. Some biocontrol researchers believe that the HSNO Act has not resulted in better decisions, just better documented, more transparent, and more considered decisions than previously.

Potential for deliberate non-compliance

The high costs of obtaining approval under the HSNO Act could create an increase in illegal releases of new organisms, which in turn could create significant adverse effects on the environment. This is particularly a concern if the regulatory hurdles are perceived as being unachievable and there is a mechanism available to avoid them. At this stage, there has only been one attempt that we are aware of to illegally release a biocontrol since the HSNO Act came into force.

Impacts of the HSNO Act on research

An increase in application costs

An increase in regulation has resulted in an increase in costs in the form of application fees, information requirements and public consultation. But the increase in costs has not been matched by an increase in funding. The application fee is generally a small portion of the overall costs but can be a financial burden to applicants because it is not covered by research funding grants. The overall high costs also mean biocontrol is not a financially viable pest control option for small or private industries that are unable to receive funding.

The HSNO Act requires an extensive amount of information to demonstrate safety. Researchers suggest that the cost of gathering this information varies, but can range from \$500,000 to several million. Some researchers believe there are diminishing returns for the increasing costs of reducing scientific and technical uncertainty, and there are limits to what can be reasonably asked for. On the other hand, the information requirements of the HSNO Act are used by researchers to justify the cost of extensive research to funding bodies, thus ensuring better science.

Limiting the type of biocontrol agents released

The HSNO Act directs the decision-maker to decline an application for release if the organism does not meet the minimum standards. The minimum standards refer to *significant* effects on native species, natural habitats, human health, genetic diversity and disease. In addition, the HSNO Act directs the decision-maker to be cautious where there is scientific or technical uncertainty. The HSNO Act does not define what constitutes a *significant* adverse effect, nor does it specify what level of scientific or technical uncertainty is acceptable.

The outcome of introducing biocontrol agents cannot be predicted with absolute certainty. Researchers believe applications will be declined if there are any potential adverse effects on non-target species. Researchers are unsure what level of risk is acceptable to the decision-maker and tend to take a very conservative approach. They attempt to reduce uncertainty through extensive host range testing, and only submit applications they are confident will be approved. Consequently, there is a risk that New Zealand could be missing out on better biocontrol options.

Perception of risk—genetic modification versus biocontrol

Some researchers find the HSNO Act excessively restrictive because they consider that they must overcome the same regulatory hurdles and precautionary approach as researchers working with genetically modified organisms (GMOs). Some perceive that the purpose of the HSNO Act is to “...prevent stuff from escaping and breeding...” which is precisely what they want biocontrol agents to do. They feel the HSNO Act is too risk averse towards biocontrol releases because it is assessed within the same framework as GMOs and is influenced by the same public wariness.

The burden of proof

The HSNO Act places the onus on the applicant to provide sufficient information for ERMA New Zealand to make an assessment of the benefits and risks. Researchers find this challenging as they must provide extensive and comprehensive information about host range and potential non-target effects. This has influenced the amount and direction of biocontrol research in New Zealand.

There is a general consensus that the level of host range testing required by the HSNO Act is similar to what researchers would do regardless of the regulations for weed biocontrol agents. Whether it's driving the science, or keeping up with the science, researchers feel the science is at a level with what the HSNO Act is demanding and is not restrictive in that sense. However, for entomophagous (insect eating) biocontrol agents, best practice for host range testing species selection has not been established. Consequently, researchers may be carrying out more extensive testing than may be necessary.

Overall observations

The purpose of the HSNO Act is to “...protect the environment, and health and safety of people...by preventing or managing the adverse effects of...new organisms.” There have been multiple biocontrol agents released under the HSNO Act with no evidence of adverse effects on the environment. At this time, it can be presumed that the HSNO Act is effective at achieving its purpose with regards to biocontrol agents. However, given the length of time it takes for a biocontrol agent to establish, and have an impact, it cannot be said for certain whether or not the HSNO Act is achieving its purpose.

Many researchers believe the HSNO Act has not made a difference to the quality of biocontrol introductions, just created better documented and transparent decisions. Scientists from Crown Research Institutes believe they would self-regulate to the same high standard in the absence of the HSNO Act. However they consider that there is potential for private research and industry to be influenced by financial drivers and other agendas.

While the HSNO Act is aiming to protect the environment, this may be coming at the expense of limiting the types of biocontrol agents being released. The costs associated with researching biocontrol agents, combined with a cautious regulatory regime, are influencing researchers. In addition, the costs of the research and making an application, combined with a lack of funding, means that biocontrol is not a financially viable pest control method for many smaller industries.

Some researchers initially believed the HSNO Act was so restrictive it would end all introductions of biocontrol agents. On the contrary, many researchers now believe the independent and transparent process created by the HSNO Act is the main reason why biocontrol releases are still continuing in New Zealand. While a less restrictive regime may increase the availability of biocontrol agents to the benefit of New Zealand, it needs to be balanced against the potential for increased risks to the environment.

Part 3

Indicator data

This section provides data for a set of numerical indicators that have been collected since 2001. There are some gaps where information may have been unavailable at the time of publication. Some data have been updated since the year they were first collected so may differ from figures shown in previous monitoring reports.

Whilst these indicators provide a useful baseline for trend analysis, some fundamental problems have been identified with the data. Some indicators do not provide enough detail to adequately inform regulatory decision-making. Some datasets have changed since they were first used and are no longer useful for long term trend analysis. Other data may not be available in any given year due to resourcing or other constraints at the source agency or other unforeseen problems. Any trends identified in the numbers shown should therefore be treated with caution and are presented here for information purposes only. See the relevant comments for each indicator for more specific detail.

Acronyms used for data sources:

CISS = The Chemical Injury Surveillance System, produced by the Institute of Environmental Science and Research

DoL = Department of Labour

ERMA NZ = Environmental Risk Management Authority

MAF = Ministry of Agriculture and Forestry

NZFS = New Zealand Fire Service

NZHIS = New Zealand Health Information Service within the Ministry of Health

Stats NZ = Statistics New Zealand

Indicator short description	Data source	Indicator number	Level P = Pressure S = State R = Response	Year								Comments
				2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	
Hazardous substances imports and exports												
Gross weight of hazardous substances imported into New Zealand	Stats NZ	27	P	1,321,355 tonnes	2,275,708 tonnes	8,784,382 tonnes	9,550,062 tonnes	9,302,164 tonnes	9,314,878 tonnes	9,474,277 tonnes	8,621,130 tonnes	Fluctuations in these figures are largely driven by changes in the petroleum market.
Gross weight of hazardous substances exported from New Zealand	Stats NZ	28	P	89,105 tonnes	Information unavailable	Information unavailable	Information unavailable	905,383 tonnes	810,105 tonnes	2,886,400 tonnes	2,596,218 tonnes	
Hazardous substance incidents												
Total number of incidents (vehicle and non-vehicle) involving hazardous substances attended by the NZ Fire Service	NZFS	21	P and S	1826	2078	1831	1,926	1,696	1819	1852	1748	
Total number of non-vehicle incidents involving hazardous substances attended by the NZ Fire Service	NZFS	22	P and S	1079	1167	1175	1,178	1065	1326	1283	1253	
Total number of incidents involving hazardous substances reported to ERMA New Zealand	ERMA NZ	23	P and S	227	230	216	223	194	237	278	188	Data may be unreliable for long-term trend analysis because there have been several changes to data sources and databases in the past two years.
Number of non-vehicle incidents involving hazardous substances attended by the NZ Fire Service where civilian injuries were recorded	NZFS	7	S	57	31	22	22	29	19	27	17	Only includes injuries from fire-related incidents
Number of non-vehicle incidents involving hazardous substances attended by the NZ Fire Service where civilian fatalities were recorded	NZFS	8	S	1	1	1	0	2	2	0	1	There was one death in 07/08 of a fire-fighter which is not defined as a civilian fatality

Indicator short description	Data source	Indicator number	Level	Year								Comments
			P = Pressure S = State R = Response	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	
Number of incidents involving hazardous substances reported to ERMA New Zealand where adverse effects on human health were recorded	ERMA NZ	9	S	59	48	30	22	42	57	71	58	Data may be unreliable for long-term trend analysis because there have been several changes to data sources and databases in the past two years.
Number of incidents involving hazardous substances reported to ERMA New Zealand where human deaths were recorded	ERMA NZ	10	S	2	1	1	0	0	6	2	3	
Number of non-vehicle incidents involving hazardous substances attended by the NZ Fire Service where environmental contamination was recorded	NZFS	15	S	1249	523	411	424	436	594	467	501	
Number of incidents involving hazardous substances reported to ERMA New Zealand where adverse effects to the environment were recorded	ERMA NZ	16	S	60	67	28	63	64	98	129	60	Data may be unreliable for long-term trend analysis because there have been several changes to data sources and databases in the past two years.
Hazards in the workplace												
Number of cases reported to DoL of diseases affecting the lungs resulting from hazardous substance use in the workplace	DoL	5	S	82	64	46	60	46	73	48	39	
Number of cases reported to DoL of poisoning or toxic effects relating to workplace exposure to hazardous substances	DoL	6	S	92	71	27	66	54	48	51	75	

Indicator short description	Data source	Indicator number	Level	Year								Comments
			P = Pressure S = State R = Response	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	
Public health effects												
Number (and rate per 100,000 population) of hospitalisations for accidental poisoning by and exposure to noxious substances, excluding foodstuffs and plants, for children aged 0-4 years	NZHS	1	S	2001: 161 (57.2)	2002: 149 (53.0)	2003: 132 (46.8)	2004: 145 (51.0)	2005: 238 (83.6)	2006: 230 (80.3)	2007: 227 (77.6)	2008: 191 (63.7)	Data to 2004 complete. Data from 2005 onward is provisional.
Number (and rate per 100,000 population) of hospitalisations for accidental poisoning by and exposure to noxious substances, excluding foodstuffs and plants, for Māori children aged 0-4 years	NZHS	2	S	2001: 39 (52.4)	2002: 49 (65.9)	2003: 28 (37.9)	2004: 34 (46.0)	2005: 54 (73.8)	2006: 47 (64.3)	2007: 53 (69.1)	2008: 48 (59.1)	Data to 2004 complete. Data from 2005 onward is provisional.
Number (and rate per 100,000 population) of deaths from accidental poisoning by and exposure to noxious substances, excluding foodstuffs and plants, for the total population	NZHS	3	S	1999: Information unavailable	2000: 12 (0.31)	2001: 7 (0.18)	2002: 12 (0.30)	2003: 21 (0.52)	2004: 17 (0.42)	2005: 16 (0.39)	2006: 7 (0.17)	Data for 2006 is provisional and is the most recent year for which cause of death is available
Number (and rate per 100,000 population) of deaths from accidental poisoning by and exposure to noxious substances, excluding foodstuffs and plants, for the Māori population	NZHS	4	S	1999: Information unavailable	2000: 3 (0.52)	2001: 0 (0)	2002: 5 (0.84)	2003: 10 (1.66)	2004: 6 (0.98)	2005: 7 (1.13)	2006: 4 (0.64)	Data for 2006 is provisional and is the most recent year for which cause of death is available
Number (and rate per 100,000 population) of hospitalisations for hazardous substance related injuries	CISS	11	S	Information unavailable	Information unavailable	2003: 7218 (193.1)	2004: 6896 (184.5)	2005: 7358 (196.9)	2006: 8061 (200.1)	2007: 8606 (213.6)	2008: 8571 (212.8)	This indicator and the following two from the CISS include therapeutic drugs and alcohol in their definition of a hazardous substance

Indicator short description	Data source	Indicator number	Level P = Pressure S = State R = Response	Year								Comments	
				2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09		
Number (and rate per 100,000 population) of hospital emergency department attendances for hazardous substance related injuries	CISS	12	S	Information unavailable	2008: 171 (13.2)	Not all District Health Boards currently report emergency department data; however more are now providing these figures. The figure for 2008 is from 6 DHBs.							
Number (and rate per 100,000 population) of deaths related to hazardous substance injuries	CISS	13	S	Information unavailable	2002: 243 (6.5)	2003: 231 (6.2)	2004: 211 (5.2)	2005: 227 (5.6)	2006: 196 (4.9)	2007: 110 (2.7)	Information unavailable		This data is continually updated, and estimated to be 80-90% complete for 2006. However data for the 2007 year is only available up to 1 July 2007 pending the installation of a new database.
New organism incidents													
Number of incidents involving approved new organisms (including GMOs) reported to ERMA New Zealand where adverse effects on human health were recorded	ERMA NZ	14	S	0	1	0	0	2	3	1	6		
Number of incidents involving approved new organisms (including GMOs) reported to ERMA New Zealand where adverse effects to the environment were recorded	ERMA NZ	20	S	0	0	0	0	0	0	0	0		No incidents involving approved GMOs are recorded as having had an adverse effect on the environment at any time since 2001

Indicator short description	Data source	Indicator number	Level	Year								Comments
			P = Pressure S = State R = Response	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	
Hazardous substances applications and approvals												
Number of hazardous substances reassessed	ERMA NZ	24	R	3	0	0	0	0	4	4	5	
Number of hazardous substances reassessed and stricter controls imposed	ERMA NZ	25	R	0	0	0	0	0	2	3	1	
Number of hazardous substances reassessed and declined	ERMA NZ	26	R	0	0	0	0	0	0	0	4	Substances reassessed and declined in 2008/09 were: Methylarsinic acid Endosulfan Methyl Parathion Pentachlorophenol (PCP)
New organisms and GMO approvals												
Number of approved new organisms (including GMOs) subsequently declared as unwanted organisms under the Biosecurity Act 1993	ERMA NZ	19	P	0	0	0	0	0	0	0	0	
Hazardous substances compliance and containment												
Number of breaches of containment involving approved hazardous substances	ERMA NZ	38	P and S	0	0	0	0	0	0	0	0	
Number of compliance orders issued by enforcement agencies	ERMA NZ	31	R	203	Information unavailable	Information unavailable	55	16	Information unavailable	82	94	Excludes infringement notices issued by the Police under the Land Transport Dangerous Goods Rules.
Number of prosecutions taken	ERMA NZ	32	R	0	Information unavailable	Information unavailable	3	0	0	0	1	

Indicator short description	Data source	Indicator number	Level	Year								Comments
			P = Pressure S = State R = Response	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	
Number of inspections where no further actions were required as a proportion of total inspections made	ERMA NZ	33	R	98%	Information unavailable	Information unavailable	99.20%	99.70%	Information unavailable	98.4%	98.1%	
Number inspections where a compliance order was issued as a proportion of total inspections made	ERMA NZ	34	R	0.01%	Information unavailable	Information unavailable	0.74%	0.30%	Information unavailable	1.6%	1.8%	
Number of inspections where a prosecution was taken as a proportion of total inspections made	ERMA NZ	35	R	0%	Information unavailable	Information unavailable	0.40%	0%	0%	0%	0.02%	
New organisms (including GMO) compliance and containment												
Number of breaches of containment involving approved new organisms (including GMOs) that did not result in an escape or release	ERMA NZ	36	P and S	4	5	3	1	0	3	2	7	
Number of breaches of containment of an approved new organism (including GMOs) that resulted in the release or escape	ERMA NZ	37	P and S	0	2	1	4	8	5	1	9	
Number of unauthorised developments of GMOs	ERMA NZ	39	P and S	0	0	0	0	0	2	0	0	
Number of intentional releases of unapproved new organisms (including GMOs)	ERMA NZ	40	P and S	2	2	1	4	1	5	1	2	

Indicator short description	Data source	Indicator number	Level	Year								Comments	
			P = Pressure S = State R = Response	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09		
Number of compliance orders issued by enforcement agency (MAF)	ERMA NZ	31	R	0	0	0	0	0	0	0	0	1	The first New Organism compliance order issued under the HSNO Act was issued in 2008/09 as a result of a breach of controls at a GM field test site.
Number of prosecutions taken	ERMA NZ	32	R	0	1	0	1	1	0	1	0	0	
Number of inspections where no further actions were required as a proportion of total inspections made	ERMA NZ	33	R	82%	83%	81%	81%	63%	65%	77%	69%		
Number inspections where a compliance order was issued as a proportion of total inspections made	ERMA NZ	34	R	0%	0%	0%	0%	0%	0%	0%	0.4%		
Number of inspections where a prosecution was taken as a proportion of total inspections made	ERMA NZ	35	R	0%	0.7%	0%	<0.5%	<0.5%	0%	<0.5%	0.4%		